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# Histomorphological Spectrum of Gastric Polyps: A Retrospective Analysis from a Tertiary Care Centre in South India

Swathy Shanker<sup>1\*</sup>, V Dhanya<sup>1</sup>, Sandeep Kunhikannan<sup>2</sup>, Mahesh Menon<sup>3</sup>, P P Sathi<sup>4</sup>

Swathy Shanker, Assistant Professor, Department of Pathology, KMCT Medical College, Kerala University of Health Sciences, Calicut, Kerala

E-MAIL: swathyshanker.ss@gmail.com

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## **ABSTRACT**

Introduction: Gastric polyps are often incidentally detected during endoscopic evaluations, with a prevalence of approximately 5% in endoscopy cases. Their diagnosis and classification rely on histopathological examination to determine their nature and potential for malignancy. Common gastric polyps include hyperplastic polyps, fundic gland polyps, and adenomatous polyps. This study aims to evaluate the histopathological spectrum of gastric polyps in a tertiary care setting and document the associated clinical presentations. Materials and Methods: This retrospective observational study was conducted from January 2019 to February 2023 at a tertiary care centre in South India. A total of 124 patients with histopathologically confirmed gastric polyps were included. Patients with known gastric malignancies were excluded. Results: The study population showed a slight female predominance (53.2%). The most common clinical complaint was dyspepsia, reported by 61% of patients. Most patients were in the age group of 51-80 years. Hyperplastic polyps were the most frequently observed type (47.16%), followed by fundic gland polyps (40.65%). The body of the stomach was the most common site of polyp occurrence (47.15%). Conclusion: The findings suggest a predominance of fundic gland polyps in the studied South Indian population. Additionally, Helicobacter pylori infection was detected in more than 45% of hyperplastic polyps, emphasizing its potential role in polyp formation. Routine histopathological evaluation remains crucial for accurate classification and risk assessment of gastric polyps. Further studies are warranted to explore

the clinical implications and long-term outcomes of gastric polyp management.

KEYWORDS: Polyps, Gastric, Endoscopy, Histopathology

## **INTRODUCTION**

Gastric polyps are typically asymptomatic and are often discovered incidentally during endoscopic examinations. In India, studies estimate that approximately 5% of gastric endoscopies reveal the presence of gastric polyps. [1] Although advances in imaging technologies such as CT and MRI have enhanced diagnostic capabilities for many gastrointestinal disorders, these modalities remain inadequate for identifying gastric polyps, necessitating endoscopic analysis. [2] While endoscopic findings may indicate the presence of polyps, histopathological examination remains the gold standard for accurate classification and diagnosis.

Gastric polyps are histologically diverse. The most common types include hyperplastic polyps, fundic gland polyps, and adenomatous polyps. Less frequent subtypes include Peutz-Jeghers polyps, juvenile polyps, carcinoids, xanthomas, and lymphomas. [3] Hyperplastic polyps are often linked to Helicobacter pylori (H. pylori)-induced inflammation, which may regress following eradication of the infection. [4] Persistent inflammation can lead to intestinal metaplasia, carrying risk of malignant transformation through mutations in genes such as p53 and Ki67. [5]

<sup>&</sup>lt;sup>1</sup>Assistant Professor, Department of Pathology, KMCT Medical College, Kerala University of Health Sciences, Calicut, Kerala

<sup>&</sup>lt;sup>2</sup>Senior Consultant and Medical Superintendent, Department of Gastroenterology, National Hospital Thazhekkod, Kozhikode, Kerala

<sup>&</sup>lt;sup>3</sup>Assistant Professor, Department of Gastroenterology, KMCT Medical College, Kerala University of Health Sciences, Calicut. Kerala

<sup>&</sup>lt;sup>4</sup>Professor and Head of Department, Department of Pathology, KMCT Medical College, Kerala University of Health Sciences, Calicut, Kerala

<sup>\*</sup>Corresponding Author:

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The likelihood of malignancy in polyps increases with their size. Consequently, polyps greater than 10 mm in diameter should ideally be resected for histopathological analysis. If H. pylori is detected in biopsy samples, follow-up biopsies are recommended three to six months after eradication therapy to confirm the infection's resolution. [6] Patients with prolonged proton pump inhibitor (PPI) use are at an elevated risk of developing fundic gland polyps, warranting annual follow-up to monitor progression. Similarly, histopathologically confirmed adenomas require one-year follow-up, while younger patients (aged <40 years) presenting with multiple polyps should be evaluated for familial adenomatous polyposis (FAP). [3]

Common clinical presentations associated with gastric polyps include dyspepsia, heartburn, abdominal discomfort, and early satiety. Larger polyps may result in more severe symptoms, such as bleeding, gastric outlet obstruction, anemia, or fatigue. [7] This study aims to examine the histopathological spectrum of gastric polyps in a tertiary care setting and analyze their associated clinical presentations.

## **MATERIALS AND METHODS**

**Study Design:** This retrospective observational study was conducted between January 2019 and February 2023 in the Department of Pathology at a tertiary care center in Kerala, India. The study included a total of 124 patients who were diagnosed with gastric polyps based on histopathological analysis. Patients with a prior diagnosis of gastric malignancies were excluded.

**Data Collection**: Histopathological reports were retrieved from the pathology department archives, while corresponding clinical and endoscopic data were collected from medical records. Demographic details, clinical symptoms, endoscopic findings, and histopathological diagnoses were documented.

**Inclusion Criteria:** Patients with endoscopically diagnosed gastric polyps and availability of complete histopathological and clinical data.

**Exclusion Criteria:** Known cases of gastric malignancies and incomplete or missing histopathological or clinical data.

**Data Analysis:** The collected data were systematically recorded in Microsoft Excel. Statistical analysis was performed using SPSS software version 22.0. Descriptive statistics were used to summarize demographic and clinical characteristics, while categorical data were presented as frequencies and percentages. Continuous variables were expressed as means with standard deviations.

# **RESULTS**

A total of 134 cases of clinically diagnosed gastric polyps were received in the Department of Pathology between January 2019 and February 2023. Of these, 10 cases showed no definitive pathological features of polyps and

were excluded from the study.

Out of the remaining 124 cases diagnosed as gastric polyps histopathologically, 66 were females, demonstrating a slight female predominance (53.2%).

The age distribution revealed that the majority of patients (66.9%) were in the age group of 51-80 years, followed by 30 patients (24.2%) in the 31-50 years age group. Six patients (4.8%) were aged 18-30 years. The lowest number of cases were recorded in those under 18 years (1.6%) and above 80 years (1.6%).

The most common presenting complaint was dyspepsia, noted in 75 patients (60.5%), followed by abdominal pain in 27 patients (21.8%), loss of appetite in 18 patients (14.5%), and vomiting in 3 patients (2.4%). **Figure 1** illustrates the proportion of cases presenting with these symptoms. It is noteworthy that multiple complaints were reported in some patients; however, the primary symptom prompting their visit to the gastroenterology department was considered.

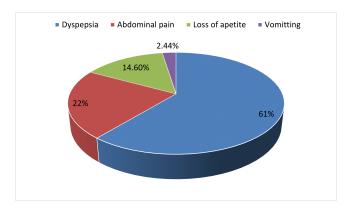


Figure 1: Percentage of cases in the study population that presented with each clinical complaint

Out of 124 cases, the most frequent histopathological diagnosis was hyperplastic polyps (47.2%), followed by fundic gland polyps (40.6%). Other diagnoses included inflammatory polyps (2.4%), adenomatous polyps with mild-to-moderate dysplasia (1.6%), juvenile polyposis (0.8%), Peutz-Jeghers polyp (0.8%), xanthoma (2.4%), parietal cell hyperplasia (2.4%), and oxyntic mucosa pseudopolyp (0.8%). **Table 1**summarizes the distribution of histopathological diagnoses.

The mean age of occurrence varied for different polyp types: hyperplastic polyps (54.5 years), fundic gland polyps (56.4 years), adenomatous polyps (78.5 years), and inflammatory polyps (42.3 years). Peutz-Jeghers polyp occurred in a 17-year-old patient, while juvenile polyposis was observed in a 45-year-old patient. Oxyntic mucosa pseudopolyp was reported in a 62-year-old individual.

An analysis of clinical presentations based on histopathological diagnoses is provided in Table 2. Dyspepsia was the most frequent symptom across all polyp types, particularly in fundic gland polyps (78%) and hyperplastic polyps (53.5%).

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Polyp Type	No. (%)
Hyperplastic polyp	59 (47.2)
Fundic gland polyp	50 (40.6)
Inflammatory polyp	3 (2.4)
Parietal cell hyperplasia	3 (2.4)
Xanthoma	3 (2.4)
Adenomatous polyp	2 (1.6)
Juvenile polyposis	1 (0.8)
Oxyntic mucosa pseudopolyp	1 (0.8)
Peutz-Jeghers polyp	1 (0.8)
Polypoidal foveolar hyperplasia	1 (0.8)
Total	124 (100)

Table 1: Distribution of histopathological diagnoses of gastric polyps

Abdominal pain was prominent in patients with hyperplastic polyps (25.9%), while loss of appetite was noted in 17.2%. Vomiting was less commonly reported.

Endoscopic analysis showed that most polyps were located in the body of the stomach (47.2%), followed by fundus (27.6%) and the antrum (25.2%). Table 3 provides details on the distribution of different polyp types by site. Hyperplastic polyps were the most common type, with the majority located in the body (21.1%), followed by the antrum (17.9%) and the fundus (8.1%). Fundic gland polyps were primarily found in the body (22.0%), with significant occurrences in the fundus (16.3%) and fewer cases in the antrum (2.4%). Adenomatous polyps were less frequent and predominantly located in the body (1.6%) and antrum (0.8%), with no cases in the fundus.

Other polyp types, including inflammatory polyps, parietal cell hyperplasia, and xanthomas, showed relatively even distributions across the three locations. Rare entities such as Peutz-Jeghers polyp, foveolar hyperplasia, and oxyntic mucosa pseudopolyp were observed in isolated cases at specific sites.

Among the 5 patients with multiple polyps, two cases were diagnosed with fundic gland polyps, and one involved an inflammatory polyp. The remaining two patients showed coexistence of hyperplastic polyp and fundic gland polyp, identified in separate biopsies from different sites. These cases highlight the importance of obtaining multiple samples during endoscopy to capture polyp heterogeneity and ensure accurate histopathological assessment.

The Table 4 summarizes the detection of H. pylori and the presence of intestinal metaplasia across different histopathological diagnoses of gastric polyps. Among the 58 cases of hyperplastic polyps, 7 cases (12.1%) showed

evidence of H. pylori infection, and 8 cases (13.8%) exhibited features of intestinal metaplasia. H. pylori infection was identified in 1 case (33.3%) of inflammatory polyps, 4 cases (8.0%) of fundic gland polyps, and 1 case (100.0%) of polypoidal foveolar hyperplasia.

### **DISCUSSION**

In our study, there was a slight female predominance, constituting 53.2% of the study population. Similarly, studies by Sonnenberg and Genta [8] and Zheng et al. [9] reported a significant female predominance. Adiwinata et al. [10] found a 6.4-fold increased risk among women for the occurrence of gastric polyps, and Cao et al. [11] reported comparable findings. The exact underlying pathophysiology for the increased occurrence of gastric polyps among women remains unclear.

The majority of patients in this study were in the age group of 51–80 years. Wang et al. [12] observed that most patients diagnosed with gastric polyps were aged 40–49 years, followed by 50–59 years, with the fewest cases in those over 70 years. Zheng et al. [9] found no significant age distribution differences for polyps in various gastric regions but noted that the detection rate increased with age, indicating a higher risk in the older population. Kadir et al. [13] reported a mean patient age of 61.0  $\pm$  15.1 years, while Durgut et al. [14] found mean ages of 55.8 years in females and 54.4 years in males.

Dyspepsia was the most common presenting complaint in our study population. Similarly, Kadir et al. <sup>[13]</sup> reported that 74.1% of patients underwent endoscopic analysis for dyspepsia. Yacoub et al. <sup>[15]</sup> found that epigastric pain was the most common symptom (34.9%), followed by anemia and dyspepsia. Jeong et al. <sup>[16]</sup> also noted that patients most commonly presented with reflux symptoms, followed by dyspepsia.

In our study, fundic gland polyps were the most common histopathological diagnosis, followed by hyperplastic polyps and benign mucosal polyps. Argüello et al. [17] reported that 42.8% of cases were hyperplastic polyps, and 37.7% were fundic gland polyps. Carmack et al. [18] found that fundic gland polyps constituted 77% of their study population. Numerous studies have shown that hyperplastic polyps are the most common type of gastric polyp. [19–21]

Yacoub et al. [15] suggested that the increased prevalence of H. pylori may be related to the higher prevalence of hyperplastic polyps. Freeman [22] and Carmack et al. [18] reported that fundic gland polyps tend to arise in individuals without H. pylori infection, with fundic gland polyps constituting 77% of their study population. Studies by Freeman [22] and Raghunath et al. [23] indicated that long-term proton pump inhibitor (PPI) use can lead to an increased incidence of fundic gland polyps, with the widespread use of PPIs potentially responsible for the increased incidence in the American population. Alqutub

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Polyp Type	Dyspepsia	Abdominal Pain	Loss of Appetite	Vomiting	Total
Hyperplastic polyp	31	15	10	3	59
Fundic gland polyp	39	6	4	1	50
Inflammatory polyp	2	1	0	0	3
Parietal cell hyperplasia	1	1	1	0	3
Xanthoma	0	2	1	0	3
Adenomatous polyp	1	0	1	0	2
Juvenile polyposis	1	0	0	0	1
Oxyntic mucosa pseudopolyp	0	0	1	0	1
Peutz-Jeghers polyp	0	1	0	0	1
Polypoidal foveolar hyperplasia	0	1	0	0	1
Total	75	27	18	4	124

Table 2: Clinical presentations based on histopathological diagnoses of gastric polyps

Polyp Type	Antrum	Body	Fundus
Hyperplastic Polyp	22 (17.9)	26 (21.1)	10 (8.1)
Fundic Gland Polyp	3 (2.4)	27 (22.0)	20 (16.3)
Inflammatory Polyp	1 (0.8)	1 (0.8)	1 (0.8)
Parietal Cell Hyperplasia	2 (1.6)	0	1 (0.8)
Xanthoma	0 (0.0)	2 (1.6)	1 (0.8)
Adenomatous Polyp	1 (0.8)	1 (0.8)	0
Juvenile Polyposis	0	0	1 (0.8)
Oxyntic Mucosa Pseudopolyp	0	1 (0.8)	0
Peutz-Jeghers Polyp	1 (0.8)	0	0
Foveolar Hyperplasia	1 (0.8)	0	0
Total	31 (25.2)	59 (47.2)	34 (27.6)

Table 3: Site of occurrence of different gastric polyps as identified on histopathology

Polyp Type	H. pylori Presence	Intestinal Metaplasia
Hyperplastic Polyp (n=59)	7 (12.1%)	8 (13.8%)
Inflammatory Polyp (n=3)	1 (33.3%)	0
Fundic Gland Polyp (n=50)	4 (8.0%)	0
Polypoidal Foveolar Hyperplasia (n=1)	1 (100%)	0

Table 4: Detection of H. pylori and the presence of intestinal metaplasia across different histopathological diagnoses of gastric polyps

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and Masoodi [24] found that long-term PPI usage was associated with a fourfold higher risk for developing gastric polyps, which may regress after discontinuation of the medication.

In our study, 23.3% of hyperplastic polyps, 25% of inflammatory polyps, and 8% of fundic gland polyps showed evidence of H. pylori. Ljubičić et al. [20] reported that all patients with hyperplastic polyps had chronic superficial gastritis, with 76% having H. pylori infection. and Stolte [25] found that 37% of patients with gastric hyperplastic polyps had underlying H. pylori infection, while Di Giulio et al. [26] reported H. pylori infection in up to 79% of patients developing gastric polyps. Hyperplastic polyps have been found to regress after eradication of H. pylori infection. Nam et al. [27] and Ouyang et al. [28] found that more than 70% of hyperplastic polyps completely resolved within 10 months of H. pylori eradication. Hyperplastic polyps are believed to be associated with H. pylori and atrophic gastritis [29, 30]. Yacoub et al. [15] reported that 62.3% of cases had H. pylori infestation. This study is limited by the inability to obtain extensive medical histories and incomplete follow-up after H. pylori eradication.

Patients with hyperplastic polyps are reported to be at increased risk of developing gastric adenocarcinoma. <sup>[31]</sup>The malignant potential of adenomas varies from 6.8% to 55.3% <sup>[32]</sup>, and the present study showed a 1.63% prevalence of adenomatous polyps.

In our study, the majority of polyps were found in the body of the stomach. Durgut et al.  $^{[14]}$  reported that 53.8% of polyps were in the antrum, 27.7% in the corpus, 10.6% in the fundus, 7.6% in the cardia, and 0.4% in the pylorus. Karaman et al.  $^{[33]}$  found that 61% of gastric polyps were located in the corpus and antrum.

We found that 26.6% of hyperplastic polyps showed the presence of intestinal metaplasia. Jeong et al.  $^{[16]}$  reported that intestinal metaplasia was more common in hyperplastic polyps compared to fundic gland polyps. Durgut et al.  $^{[14]}$  found intestinal metaplasia in 19.5% of patients with hyperplastic polyps.

## **CONCLUSION**

Our study describes the prevalence and histopathological spectrum of gastric polyps in a South Indian population, with hyperplastic polyps being the most common type (47.2%), followed by fundic gland polyps (40.6%). In this study, 12.1% of hyperplastic polyps showed evidence of H. pylori infection, and 13.8% exhibited intestinal metaplasia, highlighting their association with chronic gastritis. Most polyps were located in the body of the stomach (47.2%). Routine endoscopic and histologic evaluation is essential for accurate classification, particularly for detecting dysplastic features. Polyps >10 mm warrant resection to exclude dysplasia or malignancy. Future studies could focus on integrating histopathological findings with clinical data for

better diagnostic and therapeutic approaches.

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