

Histopathological Spectrum of Gastrointestinal Polyps: A Retrospective Study at a Tertiary Care Hospital

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ABSTRACT

Background: Gastrointestinal polypoidal lesions are commonly encountered lesions on endoscopic examination. The histopathological examination categorises these lesions into neoplastic and non-neoplastic since these have the potential to get transformed into malignancy. This study aimed to assess the clinical profile as well as the histopathological spectrum of gastrointestinal polyps observed during endoscopic evaluation.

Methods: This study was a retrospective cross-sectional observational study conducted in the department of pathology at a tertiary care centre. All the histologically diagnosed gastrointestinal polypoidal lesions over a period of eight years were retrieved from the archives. Immunohistochemistry was applied as and when necessary. Univariate analysis was performed. Categorical variables were presented in number and percentage (%), and continuous variables were presented as mean. Appropriate descriptive statistics and graphical displays for different types of data have been presented.

Result: Two hundred cases of gastrointestinal tract polypoidal lesions were included. The age of the patients ranged from 8 months to 90 years. Juvenile rectal polyp was the most frequently encountered non-neoplastic lesion constituting 42.5% (85/200) and conventional adenoma was the commonest neoplastic lesion constituting 17.5% (35/200) of cases. Most of the polypoidal lesions were less than 1 cm; however, in 6.5% (13/200) cases, it was larger than 1 cm in size.

Conclusion: The gastrointestinal tract had a diverse range of non-neoplastic and neoplastic polyps. Histopathology is important in obtaining a final diagnosis since it allows for a detailed investigation of occurrences and aids in distinguishing non-neoplastic disorders from those with clinical manifestations of malignancy.

Keywords: Gastrointestinal polyps, Hyperplastic Polyp, Conventional adenoma

ABSTRAK

Latar Belakang: Lesi polipoidal gastrointestinal merupakan lesi yang umum dijumpai pada pemeriksaan endoskopi. Pemeriksaan histopatologi mengkategorikan lesi tersebut menjadi neoplastik dan non-neoplastik karena berpotensi berubah menjadi keganasan. Penelitian ini bertujuan untuk menilai profil klinis serta spektrum histopatologis polip gastrointestinal yang diamati selama evaluasi endoskopi.

Metode: Penelitian ini merupakan penelitian observasional cross-sectional retrospektif yang dilakukan di departemen patologi di sebuah pusat perawatan tersier. Semua lesi polipoid gastrointestinal yang didiagnosis secara histologis selama delapan tahun diambil dari arsip. Imunohistokimia diterapkan jika diperlukan. Analisis univariat dilakukan. Variabel kategori disajikan dalam jumlah dan persentase (%), dan variabel kontinu disajikan sebagai mean. Statistik deskriptif dan tampilan grafis yang sesuai untuk berbagai jenis data telah disajikan.

Hasil: Dua ratus kasus lesi polipoidal saluran cerna dimasukkan. Usia pasien berkisar antara 8 bulan hingga 90 tahun. Polip rektum remaja merupakan lesi non neoplastik yang paling sering ditemukan yaitu 42.5% (85/200) dan adenoma konvensional merupakan lesi neoplastik yang paling umum yaitu 17.5% (35/200) kasus. Sebagian besar lesi polipoidal berukuran kurang dari 1 cm; namun, pada 6.5% (13/200) kasus, ukurannya lebih besar dari 1 cm.

Simpulan: Saluran cerna mempunyai beragam polip non-neoplastik dan neoplastik. Histopatologi penting dalam memperoleh diagnosis akhir karena memungkinkan penyelidikan kejadian secara rinci dan membantu membedakan kelainan non-neoplastik dari kelainan dengan manifestasi klinis keganasan.

Kata Kunci: Polip Gastrointestinal, Polip Hiperplastik, Adenoma Konvensional

INTRODUCTION

Polyps in the gastrointestinal (GI) tract are tiny elevations above the level of the surrounding mucosal surface that protrude into the lumen.¹ These are typically found in the colorectal region, although they can also be found in the oesophagus, stomach, and small intestine. Polyps are frequently discovered during regular endoscopic examinations by clinicians. With advancements in the field of endoscopic procedures, it is now feasible to determine the exact size, number, and location of polypoidal lesions. Neoplastic polypoidal lesions have malignant potential, but non-neoplastic lesions have no or minimal risk of malignant transformation.²

The existence or risk of malignancy in these polypoidal lesions is of utmost importance. The patient's age, as well as the size and location of the polyp, have been recognized as key risk factors for the development of malignancy. These polyps differ in their clinical presentation and propensity to undergo malignant transformation; hence, histological evaluation and categorization are necessary for proper patient care.³ This study aimed to assess the clinical profile as well as the histopathological spectrum of gastrointestinal polyps observed during endoscopic evaluation.

METHODS

This study was a retrospective observational study of gastrointestinal polyps from January 2014 to January 2022 conducted at ABVIMS, Dr Ram Manohar Lohia hospital, a tertiary care center in New Delhi, India. We would like to thank our institute for giving ethical permission and allowing us to collect the data. This study included all polypoidal lesions received in the department of pathology from over 10,000 gastrointestinal endoscopies. Relevant data was acquired from archival reports, which included demographic information such as age, gender, and

a family history of polyps or carcinoma, as well as endoscopic results such as anatomical location, number, size, and clinical characteristics associated with polyps. The samples were routinely processed and stained with hematoxylin and eosin. When necessary, immunohistochemistry and specific stains were used.

On histology, these polyps were categorized as epithelial and mesenchymal. Epithelial polyps were further classified as neoplastic and non-neoplastic. Non-neoplastic epithelial polyps included hyperplastic polyps, fundic gland polyps, Peutz-Jeghers polyps, juvenile rectal polyps, and other polyps. Adenomas, neuroendocrine tumors, and adenocarcinomas were all forms of neoplastic epithelial polyps. The inflammatory fibroid polyp was included in the mesenchymal polyp. Additional histological characteristics, such as dysplasia or malignancy, were observed. Univariate analysis was performed. Categorical variables were presented in number and percentage (%), and continuous variables were presented as mean. Appropriate descriptive statistics and graphical displays for different types of data have been presented.

RESULTS

There were a total of two hundred cases of gastrointestinal polypoidal lesions in the study, of which 40% (80/200) were in <20 years of age, 14% (28/200) were in the age range 21–40 years, 28% (56/200) in 41–60 years, 15.5% (31/200) in 61–80 years, and 2.5% (5/200) were in the age group > 80 years. **Figure 1** shows age of the patients ranged from 8 months to 90 years. The male: female (M: F) ratio was 2:1. The gastrointestinal polypoidal lesions observed in this study were juvenile rectal polyp, conventional adenoma, hyperplastic polyp, fundic gland polyp, inflammatory fibroid polyp, Peutz-Jeghers polyp, Brunner's gland hyperplasia, hemangiomas polyp, fibroepithelial polyp, neuroendocrine tumors, sessile serrated adenoma, and adenocarcinoma.

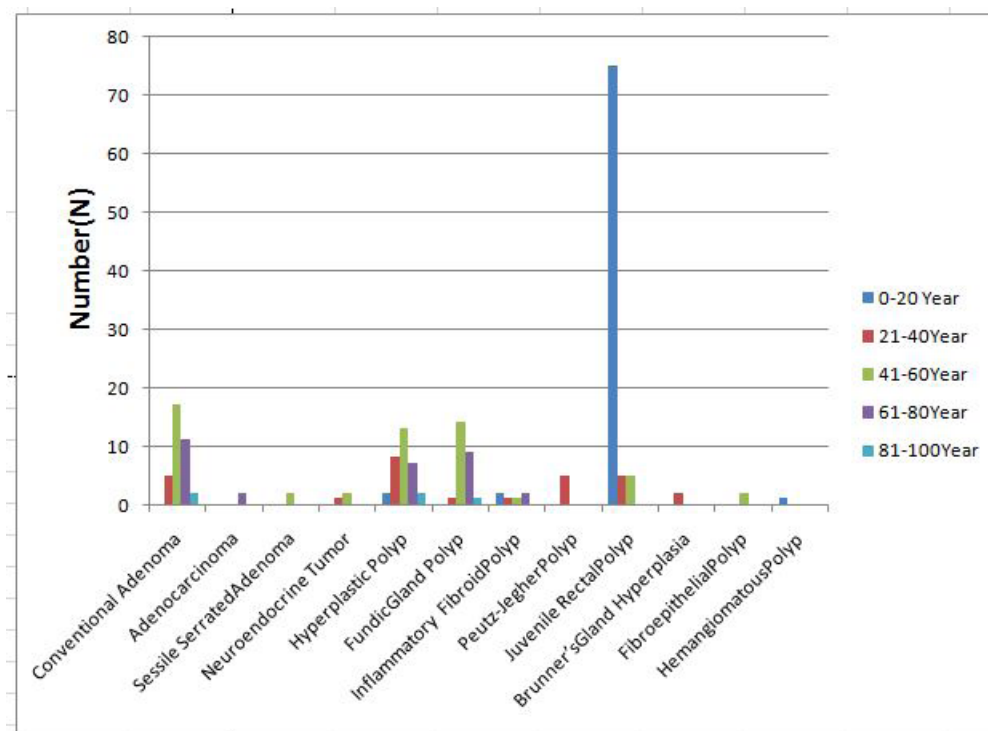


Figure 1. Distribution of Gastrointestinal Polyp according to age

Juvenile rectal polyp was the most frequently encountered lesion, constituting 42.5% (85/200) of cases, followed by conventional adenoma 17.5% (35/200), hyperplastic polyp 16% (32/200), and fundic gland polyp 12.5% (25/200). Inflammatory fibroid polyps constituted 3% (6/200), and Peutz-Jeghers polyps constituted 2.5% (5/200) of all the cases. Brunner's gland hyperplasia, fibroepithelial polyps, sessile serrated adenoma, and adenocarcinoma accounted for 1% (2/200) of all the cases each. Neuroendocrine tumors 1.5% (3/200) and hemangiomatous polyps 0.5% (1/200) constituted the other polypoidal lesions. **Table 1** shows out of all the cases, juvenile rectal polyps and conventional adenoma were the most common non-neoplastic and neoplastic polypoidal lesions, respectively. Out of the total cases, 186 patients had a single polypoidal lesion, while 14 patients had multiple lesions. In 187 cases, the polypoidal lesion was less than 1 cm; in 13 cases, it was larger.

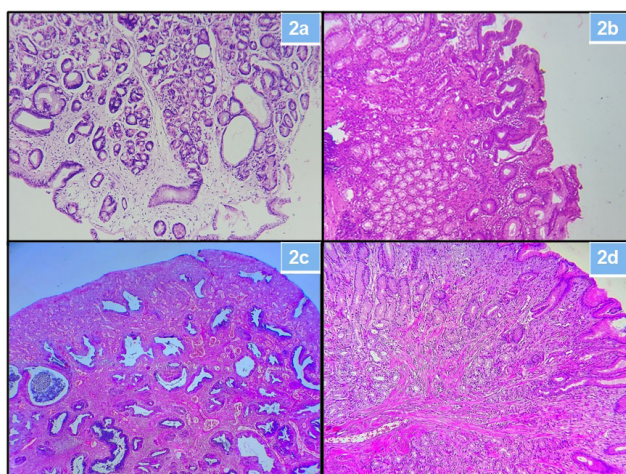
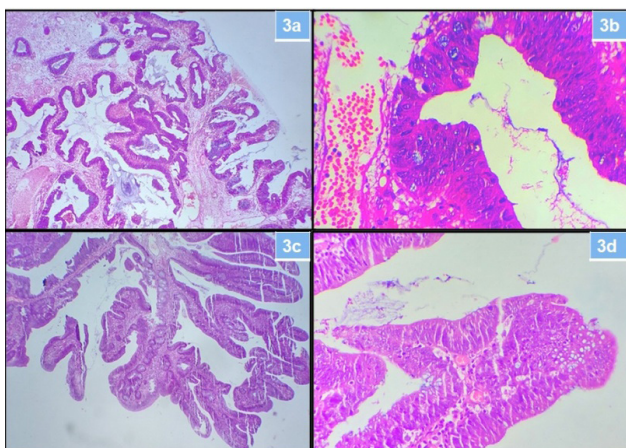
The most common site of the gastrointestinal polyp was the rectosigmoid region 60.5% (121/200), followed by the stomach 20.5% (41/200), colon 15.5% (31/200), small intestine 2% (4/200), caecum 1% (2/200), and gastroesophageal junction 0.5% (1/200). **Table 2** shows most frequent polyp seen in the rectosigmoid region was juvenile rectal polyp, followed by conventional adenoma and hyperplastic polyp. Juvenile rectal polyps were seen during the first decade, especially in the 4-6-year-old age group, with male preponderance.

Table 1. Distribution of Gastrointestinal Polyp into Neoplastic and Non-neoplastic

	Types	Number (%)
Neoplastic	Conventional Adenoma	35 (17.5%)
	Adenocarcinoma	2 (1%)
	Sessile Serrated Adenoma	2 (1%)
	Neuroendocrine Tumor	3 (1.5%)
	Juvenile Rectal Polyp	85 (42.5%)
	Hyperplastic Polyp	32 (16%)
	Fundic Gland Polyp	25 (12.5%)
Non -Neoplastic	Inflammatory Fibroid Polyp	6 (3%)
	Peutz-jeghers Polyp	5 (2.5%)
	Brunner's Gland Hyperplasia	2 (1%)
	Fibroepithelial Polyp	2 (1%)
	Hemangiomatous Polyp	1 (0.5%)

Table2. Distribution of Gastrointestinal Polyp as per anatomical location

Type of Polyp	GEJ	Stomach	Small Intestine	Cecum	Colon	Sigmoid	Rectum	Anus	Total (%)
Conventional Adenoma	0	3	0	1	15	6	9	1	35 (17.5%)
Adenocarcinoma	0	0	0	0	0	2	0	0	2 (1%)
Sessile Serrated Adenoma	0	0	0	0	2	0	0	0	2 (1%)
Neuroendocrine Tumor	0	3	0	0	0	0	0	0	3 (1.5%)
Hyperplastic Polyp	1	8	2	0	9	1	10	1	32 (16%)
Fundic Gland Polyp	0	25	0	0	0	0	0	0	25 (12.5%)
Inflammatory Fibroid Polyp	0	1	0	1	1	0	3	0	6 (3%)
Peutz-jegher Polyp	0	1	0	0	2	0	2	0	5 (2.5%)
Juvenile Rectal Polyp	0	0	0	0	2	0	83	0	85 (42.5%)
Brunner's Gland Hyperplasia	0	0	2	0	0	0	0	0	2 (1%)
Fibroepithelial Polyp	0	0	0	0	0	0	2	0	2 (1%)
Hemangiomatic Polyp	0	0	0	0	0	0	1	0	1 (0.5%)
Total (%)	1 (0.5%)	41 (20.5%)	4 (2%)	2 (1%)	31 (15.5%)	9 (4.5%)	110 (55%)	2 (1%)	200 (100%)


Figure 2: 2a: Fundic gland polyp; 2b: Hyperplastic polyp; 2c: Juvenile rectal polyp; 2d: Peutz- jeghers polyp

Figure 3: 3a&b: Tubular adenoma with dysplasia; 3c&d: Tubulovillous adenoma with dysplasia

Conventional adenoma and fundic gland polyps were the most common polyps seen in the colon and stomach, respectively. The majority of the lesions, 79% (158/200) were non-neoplastic and 21% (42/200) were neoplastic. Hyperplastic polyps are often seen between the ages of 30-75 years and are found in the rectum, colon, and stomach, with 15% of them showing goblet cell-rich morphology on histology (**Figure 2**).

Conventional adenomas were commonly located in the colon, followed by the rectum. The age ranged between 30 and 80 years. 28 of the conventional adenomas exhibited tubular morphology, 6 tubulovillous morphology, and 1 villous morphology. Most of the adenoma cases 65.7% (23/35) showed low-grade dysplasia. High-grade dysplasia was noted in 34.3% (12/35) of these cases. **Figure 3** in our study, three cases of neuroendocrine tumors and two cases of adenocarcinoma were seen presenting as polypoidal lesions. All the cases of neuroendocrine tumor and adenocarcinoma were seen in the stomach and sigmoid colon, respectively.

DISCUSSION

Cancer is a serious global health issue. The seven most common cancer sites—lung (10.6%), breast (10.5%), oesophagus (5.8%), mouth (5.7%), stomach (5.2%), liver (4.6%), and cervix uteri (4.3%) contributed to more than 40% of the overall cancer

burden. Cancers of the gastrointestinal (GI) tract account for more than a quarter (26%) of worldwide cancer incidence and more than one-third (35%) of cancer-related deaths with advancements in endoscopic biopsy, early detection of gastrointestinal polyps can prevent their progression into malignancy.^{4,5}

In our study, we discovered that gastrointestinal polypoidal lesions were more common in men than in women, with a M:F ratio of 2:1. Our findings agreed with a number of previous studies in the literature.³⁻⁴ The vast majority of lesions (79%) were non-neoplastic in nature.

In the present study, GI polyps were most frequently seen in the first decade of life, with male preponderance. This may be attributed to the high prevalence of juvenile rectal polyps, which constituted 42.5% of GI polyps. Similar findings were observed by Patil et al.⁶ and Khajuria et al.⁷ Most of the polyps were solitary. There is no evidence that solitary juvenile polyps pose an increased risk for carcinoma. Conventional adenoma was the most common neoplastic polyp. Histomorphology of these conventional adenomas showed 80% tubular adenoma, 17% tubulovillous, and 3% villous architecture. In 34% of the cases, high-grade dysplasia was found. This conclusion is consistent with numerous other studies that found tubular subtype predominance with a frequency ranging from 70.3% to 77% and high-grade dysplasia ranging from 8.6% to 21.43%.⁷

A high-fat, low-fiber diet, tobacco usage, advanced age, male gender, and excessive alcohol consumption are risk factors. Colon polyps are more likely to occur in those with a family history of intestinal polyposis, colorectal cancer, and polyps. Polyps were observed to be less common in people with inflammatory bowel disease.⁸ Invasive adenocarcinoma in an adenomatous polyp was described in two cases, which is consistent with earlier research that showed invasive carcinoma ranging from 2.85% to 5.6%.⁶ Juvenile rectal polyps, hyperplastic polyps, fundic gland polyps, inflammatory fibroid polyps, and Peutz-Jeghers polyps were the most prevalent non-neoplastic polyps. Similar findings were seen in research by Sharma et al.⁹ where 42% of the lesions were juvenile polyps and 40% of the patients were under 20 years old. In a research by Khajuria et al.⁷ juvenile rectal polyps made up 48% of the cases. It's interesting that 5% of cases of juvenile rectal polyps manifested between the ages of 20 and 60 years.

Most of the GI polyps were seen in the rectosigmoid region, followed by the stomach and colon. This is in agreement with a study that highlights that colorectal polyps are the most frequently encountered GI polyps.¹⁰

The gold standard technique for identifying and removing precancerous adenomatous polyps is currently colonoscopy. Removing adenomatous polyps has been shown to significantly lower the incidence of colorectal cancer and the mortality rate associated with it. Nevertheless, research indicates that miss rates for polyps and, more especially, adenomas, vary from 6% to 27% based on size, indicating that colonoscopy is far from ideal. Numerous studies have revealed a significant correlation between the colonoscopy withdrawal time and the detection rate of colonic adenoma; consequently, numerous guidelines recommend the colonoscopy withdrawal time.¹¹

The sigmoid colon should also be sufficiently examined during colonoscopy in order to improve the rate of adenoma detection. A 3.0% reduction in the risk of cancer was linked to every 1.0% increase in the adenoma detection rate.¹²

It's critical to identify patients who are at risk for cancer among those who have sporadic colorectal polyps. Based on histopathology, polyps have varying risk factors for colorectal cancer. In the case of serrated polyps, colonoscopic surveillance intervals are unaffected by small distal Hyperplastic Polyps (HPs), which have no significant malignant potential. On the other hand, colorectal cancer risk is elevated by Traditional Serrated Adenomas (TSA) and Sessile Serrated Lesions (SSL).¹³⁻¹⁵

Polyps of the fundic gland were frequently found in the stomach. An activating mutation in the beta-catenin gene, which is involved in cell growth signalling pathways, causes these polyps. The second most prevalent polyp was hyperplastic polyp, followed by conventional adenoma. The rate of malignant transformation of hyperplastic polyps is between 1.5 and 2.1%. There were three cases of well-differentiated neuroendocrine tumors, all located in the stomach. Two cases of hyperplastic polyp and brunner's gland hyperplasia were seen in the duodenum.

CONCLUSION

Gastrointestinal polypoidal lesions are commonly encountered during endoscopic procedures. In our study, juvenile rectal polyp was the commonest non-neoplastic polyp, and conventional adenoma was the commonest neoplastic polyp. The gastrointestinal polyps are a diverse group of lesions. It is important to categorise these lesions into neoplastic and non-neoplastic, as they pose a great risk of malignant transformation. Wherever possible, histomorphology

in conjunction with immunohistochemistry and molecular testing should be performed, since tumor biology varies within the same type of lesions. Hence, a correct diagnosis by a pathologist is of utmost importance for personalised patient care.

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