Original Article

# A Histopathological Study of Gastrointestinal Polyps in Tertiary Care Hospital, Nepal

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**Abstract**

**Introduction:** Gastrointestinal polyps may be non-neoplastic or neoplastic lesions. They are mostly asymptomatic and are common in the colon but may occur anywhere in the gastrointestinal tract. Some polyps have an increased risk for malignancy so it is important to determine the histologic type and characteristics for treatment. This study was undertaken to determine the histomorphological spectrum of polyps, their potential risk for malignancy and frequency in our center.

**Methods:** This is a descriptive study which was carried out at Kathmandu Medical College Teaching Hospital for a period of three years from 1st January 2011 to 31st December 2013. A Total of 67 polypectomy specimens were received and processed in the Pathology Department. Hematoxylin and Eosin stained slides were examined.

**Results:** 47(70.1%) gastrointestinal polyps were non-neoplastic, 19(28.3%) were neoplastic and 1(1.6%) was an infracted polyp. Most of the patients presented with rectal bleeding. The age of patients for non-neoplastic and neoplastic polyps ranged from 3- 74 and 23- 78 years, respectively. Amongst the non-neoplastic polyps, 21(44.7%) were retention polyps, 14(29.8%) were inflammatory polyps, 10(21.3%) hyperplastic polyps, 1(2.1%) benign gastric polyp and 1(2.1%) non-categorized polyp. The neoplastic polyps had 16(84.1%) adenomatous polyps, 1(5.3%) mixed polyp, 1(5.3%) fundic gland polyp and 1(5.3%) moderately differentiated adenocarcinoma. 11(68.8%) adenomatous polyps had mild dysplasia, 2 (12.5%) moderate dysplasia and 3(18.7%) severe dysplasia. Size of the non-neoplastic polyps ranged from 0.2-5.0cm and size of neoplastic polyps ranged from 0.3-6.0cm in diameter. For patients presented with more than one polyps.

**Conclusion:** Polyps have a diverse histomorphology and there is risk of malignancy in the adeomatous polyps so it is important to screen patients for treatment and cancer prevention.

**Keywords:** adenomatous polyps, hyperplastic polyps, inflammatory polyps, retention polyps.

## Introduction

Gastrointestinal polyps as polypectomy specimens are common in surgical pathology departments. These polyps can have varied morphologic spectrum but the pre-malignant adenomatous polyps are of importance because of the association between them and colorectal carcinoma. It is estimated that between 70%-90% of colorectal cancers arise from adenomatous polyps.[1] The incidence of adenomatous polyps and carcinomas of the colon is high in Western Europe and United states in contrast to the low incidence of both among Afro Asian populations.[2,3]

Polyps can be asymptomatic or can present with bleeding from twisting or vascular obstruction. They can occur in

several locations like in the esophagus, stomach, or small intestine but are most common in the colon. They may develop as a result of epithelial or stromal cell hyperplasia, inflammation, ectopia or neoplasia.[4]

Polyps can be categorized as non-neoplastic and neoplastic polyps. The nomenclature for gastric polyps is confusing , one of the reasons being that in the past they have often been regarded as analogous to colorectal polyps in microscopic appearance and natural history.[5] However, most types of gastric polyps do not have an exact counterpart in the large bowel.[6] They are incidentally discovered in about 2% of upper endoscopies.[7] The gastric non-neoplastic polyps are hyperplastic polyps, inflammatory fibroid polyp, hamartomatous and developmental polyps and polyps of Cronkhite Canada Syndrome. Gastric neoplastic polyps that are encountered are the adenomas, carcinomas, carcinoids and fundic gland polyp. Other miscellaneous lesions with polypoid growth pattern like xanthelesma, lymphoid hyperplasia/ lymphoma, mesenchymal stromal tumors and vascular tumors may also be observed.

The hyperplastic/ inflammatory gastric polyps comprise approximately 75% of all gastric polyps. They are suggested to be different stages of the same process and are seen in association with hypochlorhydria, low levels of pepsinogen I, gastric atrophy and chronic gastritis.[8] Chronic gastritis initiates the injury and reactive hyperplasia that leads to polyp growth. Although regarded as non-neoplastic they share some molecular alterations with adenomatous lesions. The Risk of dysplasia correlates with size in these polyps especially if size is larger than 1.5cm.

Inflammatory fibroid polyps are uncommon and are found mostly in antropyloric region. Described by Vanek in 1949 as "gastric submucosal granuloma with eosinophilic infiltration",[9] these polyps are characterized by the proliferation of spindle cells, small blood vessels, and inflammatory cells, often dominated by eosinophils.[10]

Hamartomatous polyps occur sporadically or in various genetically determined or acquired syndromes. Hamartomas are often solitary ( juvenile polyps), but may occur as part of a hamartomatous polyposis syndrome, such as Peutz Jeghers syndrome, Juvenile polyposis, Cowden disease or Cronkite Canada Syndrome. Juvenile polyps may be sporadic or syndromic. They are the most frequent colonic polyps seen in children, but one third of cases occur in adults.[11] Most of these polyps occur in the rectosigmoid area singly but more than one polyp can be present.[12] These polyps have been regarded as non-neoplastic however, occasionally foci of severe dysplasia/ CIS and genetic alteration (k-ras mutations) raises doubts about their true nature.[13] Rarely, juvenile polyposis may have three to as many as hundred hamartomatous polyps which can be life threatening and associated with development of adenomatous polyps and adenocarcinoma.[14]

Fundic gland polyps occur sporadically and in individuals with familial adenomatous polyp. Therapy with proton pump inhibitors has increased the prevalence of these polyps. This reflects increased gastrin secretion in response to reduced gastric acidity, and the resulting glandular hyperplasia. It has been proposed that the key molecular alteration in sporadic fundic gland polyps is an activating mutation of the β-catenin gene.[15] These polyps are more common in women and are discovered at an average age of 50 years.

Adenomas of stomach unlike colonic adenomas which arise from apparently normal mucosa arise in a background of chronic gastritis with intestinal metaplasia and autoimmune gastritis. Adenomatous polyps can be categorized as tubular adenomas, villous adenomas and tubulovillous adenomas. Tubular adenomas exhibit more than 75% tubular architecture, villous adenomas more than 50% villous architecture and tubulovillous adenomas contain 25% to 50% villous architecture.[4]

Mixed (hyperplastic and adenomatous) polyps are also recognized. They should be distinguished from the more common regenerative changes commonly seen focally at the surface of hyperplastic polyps.[12]

The majority of polyps in the colon are hyperplastic polyps, adenomas and inflammatory polyps.[16] Hyperplastic polyps represent 90% of all epithelial polyps in the large intestine. They result from decreased epithelial cell turnover and accumulation of mature cells on the surface. The inflammatory polyps, also known as pseudopolyps, represent inflamed regenerating mucosa surrounded by ulceration. These are seen mostly in patients with severe, active IBD. Inflammatory polyps may also be associated with mucosal prolapse.

This study was done to observe the frequency, site, histomorphologic spectrum and malignant potential of polypectomy specimens in our center.

## Methods

This descriptive study was done in the Department of Pathology, KMCTH over a period of three years from 1st January 2011 to 31st December 2013. All gastrointestinal polypectomy specimens were included in the study. Relevant data, including age and size of polyp were obtained from the histopathological forms. Specimens were processed and slides stained with Hematoxylin and Eosin (H&E) were studied.

## Results

Out of 67 polypoid lesions of gastrointestinal tract 56(83.6%) were present in the large intestine, 9(13.4%) in stomach, 1(1.5%) in gastro-esophageal junction, and 1(1.5%) in small intestine. There were 47(70.1%) non-neoplastic polyps, 19(28.3%) neoplastic polyps and 1(1.6%) infracted polyp. Distributions and types of the 67polypoid lesions in the gastrointestinal tract are shown in Table 1. Size of the non-neoplastic polyps ranged from 0.2-5.0cm diameter and neoplastic polyps ranged from 0.3-6.0cm in diameter.

Among the non-neoplastic polyps, retention polyps were the commonest 21(44.7%) while adenomatous polyps 16(84.1%) were the common neoplastic polyps. The age range of patients for non-neoplastic polyps was from 3-74years while for neoplastic polyps the age range was from 23-78years. Polyp ratio among males and females was 2.3:1. The gender distribution of the polyps is given in Table 2. Retention polyps and adenomatous polyps were more common among males as compared to females.

**Table 1: Distribution and types of the polyps in the gastrointestinal tract**

| Site | Type of Polyp | No. of Polyp | Percentage |
|---|---|---|---|
| **G-E junction** | Hyperplastic polyp | 1 | 1.5% |
| **Stomach** | Inflammatory polyp | 1 | 1.5% |
| | Hyperplastic polyp | 5 | 7.5% |
| | Benign gastric polyp | 1 | 1.5% |
| | Fundic gland polyp | 1 | 1.5% |
| | Mixed polyp | 1 | 1.5% |
| **Duodenum** | Inflammatory polyp | 1 | 1.5% |
| **Large Intestine** | Inflammatory polyp | 12 | 18% |
| | Hyperplastic polyp | 4 | 6% |
| | Juvenile retention polyp | 15 | 22% |
| | Retention polyp | 6 | 9% |
| | Non-neoplastic polyp | 1 | 1.5% |
| | Infarcted polyp | 1 | 1.5% |
| | Adenomatous polyps | 16 | 24% |
| | Adenocarcinoma | 1 | 1.5% |
| **Total** | | 67 | 100% |

**Table 2: Gender distribution of polyps**

| Type of polyp | Male No. (%) | Female No. (%) | Total polyps and Overall Percentage |
|---|---|---|---|
| Inflammatory polyp | 8(57%) | 6(43%) | 14(21%) |
| Hyperplastic polyp | 4(40%) | 6(60%) | 10(15%) |
| Juvenile retention polyp | 11(73%) | 4(27%) | 15(22%) |
| Retention polyp | 5(83%) | 1(17%) | 6(9%) |
| Benign gastric polyp | 0(0%) | 1(100%) | 1(1.5%) |
| Fundic gland polyp | 1(100%) | 0(0%) | 1(1.5%) |
| Mixed polyp Non-neoplastic polyp | 0(0%) | 1(100%) | 1(1.5%) |
| | 1(100%) | 0(0%) | 1(1.5%) |
| Infarcted polyp | 1(100%) | 0(0%) | 1(1.5%) |
| Adenomatous polyp | 15(94%) | 1(6%) | 16(24%) |
| Adenocarcinoma | 1(100%) | 0(0%) | 1(1.5%) |
| **Total** | **47** | **20** | **67(100%)** |

There were 16 adenomatous polyps out of which 15(94%) was found in males and 1(6%) was found in a female patient. 11(68.8%) of adenomatous polyps had mild dysplasia, 2(12.5%) had moderate dysplasia and 3(18.7%) had severe dysplasia. The histological types of the 16 adenomatous polyps are given in Table 3.

**Table 3: Histologic types of 16 adenomatous polyps**

| Histologic type | Number | Percentage |
|---|---|---|
| **Tubular** | 12 | 75% |
| **Tubulovillous** | 01 | 06% |
| **Villous** | 03 | 19% |
| **Total** | 16 | 100% |

## Discussion

Polypoid lesions of the gastrointestinal tract are usually received for histopathological examination in the form of biopsies or endoscopic polypectomy specimens. Establishing a diagnosis, categorizing it into one of the general polyp categories and determining whether the lesion has been adequately excised is important for the clinical management. Frequency of adenomatous polyps and their malignant potential is of great concern as they are precursors of most colorectal cancers. It is estimated that between 70% and 90% of colorectal cancers arise from adenomatous polyps.[17] The risk for malignant potential of these polyps correlates with size and older patient age.[18] Also with increasing number of adenomatous polyps the risk of colon cancer markedly increases.[19] Colorectal cancer represents the final stage of a slow multistep carcinogenic process. This malignancy has a significant incidence, is life threatening and has a long asymptomatic period during which it can be diagnosed in an early stage that is amenable to treatment.[20]

In this study large intestine was the commonest site for the polyps 56(83.6%) followed by stomach with 9(13.4%) and 1(1.5%) case each for gastro-esophageal junction and small intestine. In comparison to a similar pioneer study done by Rahat N. et al[21], they found 142(93.42%) polyps in large intestine followed by 6(3.9%) in stomach, 3(1.98%) in small intestine and 1(0.66%) in esophagus out of 152 polyps.

In this study retention polyps 21(44.7%) were the most common among the 47(70.1%) non-neoplastic polyps. There were 15(31.9% ) polyps in children and 6(12.8% ) polyps in adults. Juvenile polyps frequently occur in children, but are also encountered in adults.[22] In the study by Rahat N. et al, Juvenile polyps were the commonest polyps accounting for 100(65.78%). While a study done by Geramizadeh B. et al[22] on colorectal polyps found 603(60.9%) adenomatous polyps, 300 (30.3%) hyperplastic polyps, 80(8.1% ) juvenile, 5(0.5% ) inflammatory and 2(0.2% ) Peutz-Jeghers polyps from a total of 990 polyps. Rahat N. et al had 8(8%) of Juvenile polyps showing low grade dysplasia while in our study none of the retention polyps showed any dysplasia.

Among the 19(28.3%) neoplastic polyps in the study, the most common was the adenomatous polyp 16(84.1%). It was more common in males 15(94%) than in female 6(16%) as compared to the study by Rahat N. et al in which they found it to be more common in females with a male to female ratio of 1:1.2. Tubular adenomas 12(75%) were the commonest finding in accordance with other reports.[21,24] In a study done by Patil R, et al[25] they found 68(35.4%) adenomatous polyps among which tubular adenoma was the commonest 38(56%). In another study by Shinya[26] 7000 polyps were studied which revealed 2.8%, 8.4%, and 9.5% of tubular adenomas, tubulovillous adenomas, and villous adenomas. The grade of dysplasia in the present study for these polyps was 11(68.8%) mild dysplasia, 2(12.5%) moderate dysplasia and 3(18.7%) severe dysplasia. Comparing to the study done by Rahat N. et al they had 14(77.8%) with low grade dysplasia, 3(16.6) cases with high grade dysplasia and malignant change in 1(5.6%).

Although non-neoplastic polyps in the present study had size ranging from 0.2-5.0cm in diameter, most were less than 1 cm in diameter. Size of neoplastic polyps ranged from 0.3-6.0cm in diameter. Atkin et al.[27] stated that a polyp size of 1 cm or greater had a significantly increased risk of developing subsequent colorectal cancer; but those with polyps less than 1 cm did not have an increased risk of cancer. In the study by Rahat N, et al size of polyps ranged from 0.5-2.5cm in diameter.

## Conclusion

Understanding the pathogenesis for the different types of gastrointestinal polyps and recognizing the premalignant lesions on histopathology is important for the clinical management of the patient. The size of these polyps, villous architecture, grade of dysplasia, whether single or multiple, family history and invasive components should be studied in detail and if possible follow-up of patients should be done for proper treatment of patients. So, more studies need to be done in our population to determine the true incidence and prognosis of these lesions.

**Conflict of interest:** None declared.

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