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Clinical Characteristics and Complications of Polypectomy of Colorectal Polyps: An Observational study from Western Nepal

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ABSTRACT

Background

Colorectal polyps are precursor lesion for colorectal cancer. Polyps are detected and managed by polypectomy during colonoscopy. Polypectomy requires endoscopic expertise and adequate resources but is associated with complications. The objective of this study was to characterize colorectal polyps and assess the complications of polypectomy at our centre.

Methods

This is a retrospective, cross sectional, hospital based observational study done during January 2021-December 2024 at Fewacity Hospital Pvt. Ltd., Pokhara, Nepal after an ethical clearance. Detected colorectal polyps were characterized by number, location, size and managed by polypectomy during colonoscopy. Recommended polypectomy techniques were applied and complications managed appropriately. Data was entered in Microsoft Excel 2024 and descriptive analysis was done.

Results

Rectal polyps (23.5%) were commonest followed by sigmoid polyps. Inflammatory (42%) followed by tubular adenoma (35%) were common histological types identified. Large size polyps (>10mm) comprised of 21%. Cold snare was common polypectomy technique applied (68%). Assisted polypectomy technique was required in 37 patients (11%). Overall complications developed in nine patients (2.7%) with polypectomy. Delayed bleeding was the commonest complication reported among 7 patients (2.8% in hot snare polypectomy and 0.8% in cold snare polypectomy) and was managed with endoclips application.

Conclusions

Colorectal polyps were detected in 19% of patients with rectum as commonest location and inflammatory as common histological subtype. Post polypectomy bleeding was the commonest complication and was managed by endoscopic techniques.

Keywords: Colonoscopy; Complications; Colorectal polyps; Polypectomy.

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INTRODUCTION

A colonic polyp is defined as a mass protruding into the lumen of colon, are classified according to their gross appearance as sessile or pedunculated.^१ Colorectal polyps are precursor lesion for development colorectal cancer, the fourth most diagnosed malignancy worldwide.^२ Colorectal polyps are histologically classified as neoplastic (villous, tubulovillous, tubular), hyperplastic, hamartomatous, or inflammatory.^३ The polyp detection rate in Nepal varies between 12.9-27% by colonoscopy, which increases with age.^{३,४} Though largely unknown, multiple environmental factors like smoking, alcohol, obesity, high intake of red meat, low fiber and calcium and genetic factors contribute to development of colonic adenomatous polyps whereas non-steroidal anti-inflammatory medications (NSAIDs) and statins, has been shown to have a protective effect.^{३,५,६} Polyps are treated by polypectomy depending on the size, location, number, clinical expertise and available resources. Adenomatous polyps >10mm, larger size >25mm, multiple polyps, right sided location, serrated polyps, villous type and dysplastic have high malignant potential.^{७-९} Cold snare polypectomy (CSP) is recommended for small and diminutive sessile polyps, whereas hot snare polypectomy (HSP) for intermediate size sessile polyps (10mm-19mm) and a growing interest of cold snare polypectomy for the same. Endoscopic submucosal resection (ESD) or endoscopic mucosal resection (EMR) is recommended for large sessile polyps (>20mm) considering the morphology, histology, chance of complete removal and possible complications. HSP is recommended for all pedunculated polyps.^{१०,११} Adequate resection of these polyps reduces the malignant transformation by 90%.^{१२} Techniques to improve polyp detection and complete resection is challenging to achieve especially for larger non pedunculated polyps.^{१३} Important factors that increase the rate of complications are sessile polyps, large size, tubular histology, drugs intake (antiplatelets/anticoagulants), comorbidities and lack of preventive measures before polypectomy.^{१४} Bleeding, perforation, post polypectomy

coagulation syndrome, partial resection are common complications following polypectomy.^{१५,१६} Surgical resection of benign appearing polyps is currently not preferred due to need of anesthesia and hospitalization. Limited data exists regarding the clinicopathological characteristics and the complications of polypectomy in Nepal. The aim of this study is to characterize colorectal polyps and assess the outcome of polypectomy.

METHODS

Study Design

This was a hospital-based, retrospective, cross-sectional observational study conducted at Fewacity Hospital, Pokhara, Nepal.

Study Area

The study was carried out in the endoscopy unit of Fewacity Hospital Pvt. Ltd., Pokhara, Nepal, where colonoscopy procedures were performed for patients presenting with various lower gastrointestinal symptoms.

Study Population

The study population included patients who underwent colonoscopy and were diagnosed with colorectal polyps during the study period from January 2021 to December 2024.

Sample Size

All eligible patients who underwent colonoscopy and had detected colorectal polyps managed by standard polypectomy during the study period were included.

Sampling Technique

A total enumerative (consecutive) sampling technique was used, including all eligible patients meeting the inclusion criteria during the study period. Patients refusing consent, those with colorectal cancer, familial polyposis syndrome, inflammatory bowel disease, or polyps larger than 25 mm were excluded.

Data Collection Tools and Technique

Data were collected using a structured proforma. Colonoscopy was performed using Fujifilm BL-7000 after adequate bowel preparation, assessed by Boston Bowel Preparation Score (BBPS >6/9), with a minimum withdrawal time of 6 minutes. Bowel

preparation was done using polyethylene glycol sachets (118 g each) dissolved in 2 liters of water, taken within 5 hours as instructed by trained nurses. The anatomical location, number, and size of polyps were recorded. Polypectomy techniques included cold snare polypectomy (CSP) for polyps <10 mm, hot snare polypectomy (HSP) for 10-20 mm, and endoscopic mucosal resection (EMR) for 20-25 mm sessile polyps. Pedunculated polyps were managed using cold or hot snare techniques with endoloop or endoclip assistance when required. Clinical data including age, gender, indication for procedure, BBPS score, and cecal intubation were recorded. Post-procedure complications such as perforation, post-polypectomy bleeding (up to 14 days), and symptoms of post-polypectomy coagulation syndrome were monitored for two weeks through follow-up visits or telephone calls.

Variables/Measurements

The study variables included patient demographic characteristics (age, gender), procedural variables (indication for colonoscopy, bowel preparation quality, BBPS score, cecal intubation), and polyp characteristics (location, number, and size). Outcome variables included procedural success and complications such as perforation, post-polypectomy bleeding, and post-polypectomy coagulation syndrome.

Statistical Analysis Used

Data were entered and analyzed using Microsoft Excel 2024 (Microsoft Corporation, Redmond, WA). Continuous variables were expressed as mean, while categorical variables were presented as frequency and percentage.

Ethical Consideration

Ethical approval was obtained from the Nepal Health Research Council, Kathmandu (Ref no. 2356, dated 22 April 2025). Written informed consent was obtained from all participants before the procedure. Patients refusing consent or meeting exclusion criteria were not included in the study. Confidentiality and anonymity were maintained throughout the study, and patient data were used solely for research purposes.

RESULTS

A total of 331 patients among the 1709 colonoscopies performed during the study period were eligible for study. Colonoscopy was performed between 16 years-93 years with mean age of 58 ± 16.4 years. Gender distribution of study population was almost equal with maximum patients ($n=130, 39\%$) from age group of 60-80 years followed by 40-60 years ($n=126, 38\%$) (table 1). Majority of patients complained of pain abdomen (44%) followed by constipation (Figure 1).

Table 1. Age and gender distribution (n=331).

Age (years)	Male n (%)	Female n (%)
< 20	4 (1.2)	2 (0.6)
20-40	23 (6.9)	16 (4.8)
40-60	65 (19.6)	61 (18.4)
60-80	55 (16.6)	75 (22.7)
> 80	20 (6.0)	10 (3.0)

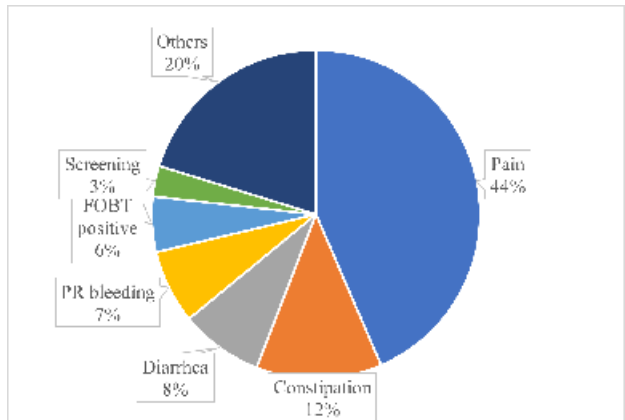


Figure 1. Indications of colonoscopy (n=331).

The most commonly involved segment was rectum (23.5%) followed by sigmoid colon (19.3%). Both left and right sided colonic segments were involved in 64 patients (19.3%). Inflammatory polyps (41.9%) followed by tubular adenoma (34.7%) and hyperplastic polyps (9.3%) were the common histological types identified. Three patients (0.9%) had malignant transformation (Table 2).

Table 2. Type of polyps (n=331).

Histology of polyps	Frequency n (%)
Adenoma	
Tubular	115 (34.7)
Tubulovillous	12 (3.6)
Villous	5 (1.5)
Inflammatory	139 (41.9)

Hyperplastic	51 (9.3)
Juvenile	4 (1.2)
Carcinoma	3 (0.9)
Serrated	2 (0.6)

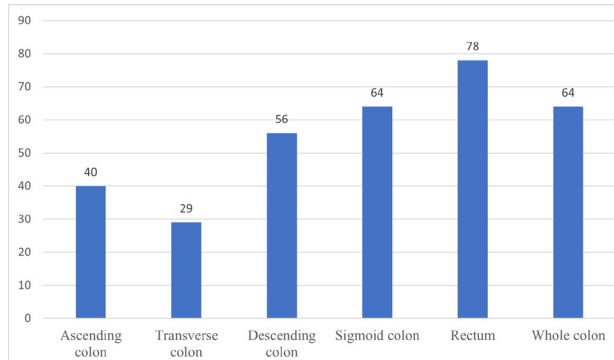


Figure 2. Anatomical location of polyps (n=331).

Cold snare polypectomy and hot snare polypectomy were performed in 227 and 104 patients respectively with assisted polypectomy techniques in 37 patients (11.1%). Two patients among HSP had EMR with assisted polypectomy. None of the patients required hospital admission for immediate post procedure pain, bleeding or perforation. Delayed bleeding was reported among 4 patients (2.8% in HSP and 0.8% in CSP) and was managed with endoclips application. Post coagulation syndrome was developed in two patients and were managed with bowel rest, intravenous antibiotics, fluids and analgesics and discharged on fifth and sixth day respectively with recovery (Table 3).

Table 3. Polypectomy technique and complications (n=331).	
Subtype/Technique	Frequency (%)
Polypectomy technique	
CSP	227 (68.5)
HSP	104 (31.4)
Endoclips	30 (9.1)
Endoloop + Endoclip	7 (2.1)
Complications	
Delayed bleeding (CSP)	2 (0.8)
Delayed bleeding (HSP)	5 (4.8)
Post coagulation syndrome (HSP)	2 (1.9)
Bowel perforation	0
Death	0
Requiring blood transfusion	1 (0.3)
Requirement for surgical management	0

DISCUSSION

Polyps are detected during colonoscopy examination, majority as an incidental finding for evaluation of lower gastrointestinal symptoms. Symptomatic polyps cause altered bowel function, per rectal bleeding or tenesmus. The polyp detection rate 19.3% was higher than previously reported from Nepal and India. ^{४,३३-३४} The mean age was higher than study from other studies from Nepal. Equal gender distribution was found in this study against male predominance of colorectal polyps from various parts of the world. ^{३५,३६} Pain abdomen was the commonest indication for colonoscopy examination. Polyp detection rate was 19.3% and inflammatory polyps were the commonest polyps detected (41.9%). Sessile polyps were common morphology (74%) and large size comprised of 21.4% of polyps. Overall adenoma detection rate was 7.7% with tubular adenoma as the predominant lesion. Anatomically isolated rectum involvement was detected in 78 patients (23.5%) as commonest site. As colonoscopy was performed in symptomatic patients in our settings, the nature of polyp and adenoma detection rate might not reflect the exact nature of polyps as far as screening for colorectal cancer is concerned.

Most polyps were detected among age group of 60-80 years followed by 40-60 years which explains the natural tendency of development, progression of polyp and causation of gastrointestinal symptoms demanding colonoscopy examination not only as management tool but also emphasizing the screening role in our clinical settings. The low detection rate of serrated polyps in our study demands further expertise in terms of identification, resection and histological interpretation. Few large polyps are carcinomatous at colonoscopic diagnosis, which requires high index of suspicion preferably with application advanced imaging techniques and appropriate polypectomy tools for complete resection. Assisted polypectomy techniques were required in 11.1% of our patients which emphasizes the need of therapeutic armamentarium in every endoscopy unit for complete management of polyps. Diagnostic colonoscopy is generally considered

as safe procedure. Detection, colonoscopic characterization, complete resection, histological examination and without significant complications is the best therapeutic approach for colorectal polyps preferably at same examination setting. CSP was commonest technique applied for polypectomy (68.5%) in our study, which is evident according to polyp characteristics. Nine patients (2.7%), had complication within 14 days. Significant bleeding requiring intervention was the commonest complication, which was higher in hot snare polypectomy in diabetic patients with large size. The bleeding rate is higher than from UK²⁴ where the national standard of bleeding rate is standardized as 1:100, which might be due to endoscopist factors. None of our patient developed perforation or deaths due to polypectomy. Studies have demonstrated large polyp size, multiple polyps, right sided location, older age and low volume centers as high rate of polypectomy complications.^{16,24}

Limitations

Lack of screening colonoscopy to detect accurate adenoma detection rate, inability to document the adenomatous location of polyps and failure to evaluate of post polypectomy recurrence rate are the limitation of our study.

Conclusions

Colorectal polyps were detected in almost 19% of patients with rectum as commonest location and inflammatory as common histological subtype. Adenoma detection rate was 7.7% in symptomatic patients. Post polypectomy bleeding was the

commonest complication requiring intervention.

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Ethical and Publication Integrity: Ethical approval was obtained from the Nepal Health Research Council, Kathmandu (Ref no. 2356, dated 22 April 2025). Written informed consent was obtained from all participants before the procedure. Patients refusing consent or meeting exclusion criteria were not included in the study. Confidentiality and anonymity were maintained throughout the study, and patient data were used solely for research purposes.

Availability of data and materials: All data analyzed during this study will be available from the corresponding author upon reasonable request.

Authors' Contributions

Conceptualization: Jiwan Thapa.

Data curation: Jiwan Thapa, Suresh Thapa.

Formal analysis: Suresh Thapa.

Investigation: Jiwan Thapa.

Methodology: Jiwan Thapa.

Supervision: Anuja Bhandari Thapa.

Writing-original draft: Jiwan Thapa.

Writing-review & editing: Jiwan Thapa, Anuja

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