Frequency and nature of endoscopic and pathologic errors leading to referral for endoscopic resection to a tertiary center


Affiliations below.

DOI: 10.1055/a-1959-6012

Please cite this article as: Lahr R E, McWhinney C D, Cummings O W et al. Frequency and nature of endoscopic and pathologic errors leading to referral for endoscopic resection to a tertiary center. Endoscopy International Open 2022. doi: 10.1055/a-1959-6012

Conflict of Interest: Douglas K. Rex:
Consultant: Olympus Corporation, Boston Scientific, Aries Pharmaceutical, Braintree Laboratories, Lumendi, Ltd., Norgine, Endokey, GI Supply, Medtronic, Acacia Pharmaceuticals
Research Support: EndoAid, Olympus Corporation, Medivators, Erbe USA Inc, Braintree Laboratories
Shareholder: Satisfai Health

Abstract:
Background and study aims
We anecdotally encounter cases where referring endoscopists made errors in endoscopic interpretation of a colorectal lesion, sometimes combined with pathology errors at the referring centers, resulting in referral to our center for endoscopic resection. In this paper, we describe the frequency and nature of endoscopic and pathology errors leading to consultation for endoscopic resection.

Patients and methods
Review of 760 consecutive referrals to our center over a 26 month interval.

Results
In total, 28 (3.7%) of all referred patients had ≥ 1 lesion that did not require any resection after investigation. There were 12 cases (1.6% of all referrals) involving errors by both the referring endoscopist and the pathologist at the referring center. Errors commonly involved the ileocecal valve, lipomas, and mucosal prolapse changes. There were 15 additional referrals (2.0% of all referrals) where no neoplastic lesion was identified at our center and either no biopsy was taken at the referring center (n = 9 patients, 10 lesions), the patient was referred although biopsy showed no neoplasia (n = 6), or the referring doctor correctly interpreted the lesion (lipoma), but the outside pathologist incorrectly reported adenoma (n = 1).

Conclusions
Endoscopists at tertiary centers should expect referrals to clarify the nature of colorectal lesions as neoplastic or non-neoplastic. Community endoscopists with equivocal endoscopic findings and unexpected or equivocal pathology results can consider pathology review at their center or at an expert center before referral for endoscopic or surgical resection.

Corresponding Author:
Douglas K. Rex, Indiana University School of Medicine, Division of Gastroenterology/Hepatology, 550 N. University Blvd., 46202-5114 Indianapolis, United States, drex@iu.edu

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Affiliations:
Rachel E Lahr, Indiana University School of Medicine, Division of Gastroenterology/Hepatology, Indianapolis, United States
Connor D McWhinney, Indiana University School of Medicine, Division of Gastroenterology/Hepatology, Indianapolis, United States
Oscar W Cummings, Indiana University School of Medicine, Department of Pathology and Laboratory Medicine, Indianapolis, United States
Douglas K. Rex, Indiana University School of Medicine, Division of Gastroenterology/Hepatology, Indianapolis, United States
Frequency and nature of endoscopic and pathologic errors leading to referral for endoscopic resection to a tertiary center

Rachel E. Lahr, BS
Connor D. McWhinney, BS
Oscar W. Cummings, MD
Douglas K. Rex, MD

1Division of Gastroenterology/Hepatology
Indiana University School of Medicine
Indianapolis, IN

2Department of Pathology and Laboratory Medicine
Indiana University School of Medicine
Indianapolis, IN

Correspondence:
Douglas K. Rex, MD
550 N. University Blvd
Suite 4100
Indianapolis, IN 46202
(317) 948-8741
drex@iu.edu
Abstract

Background and study aims

We anecdotally encounter cases where referring endoscopists made errors in endoscopic interpretation of a colorectal lesion, sometimes combined with pathology errors at the referring centers, resulting in referral to our center for endoscopic resection. In this paper, we describe the frequency and nature of endoscopic and pathology errors leading to consultation for endoscopic resection.

Patients and methods

Review of 760 consecutive referrals to our center over a 26 month interval.

Results

In total, 28 (3.7%) of all referred patients had ≥ 1 lesion that did not require any resection after investigation. There were 12 cases (1.6% of all referrals) involving errors by both the referring endoscopist and the pathologist at the referring center. Errors commonly involved the ileocecal valve, lipomas, and mucosal prolapse changes. There were 15 additional referrals (2.0% of all referrals) where no neoplastic lesion was identified at our center and either no biopsy was taken at the referring center (n = 9 patients, 10 lesions), the patient was referred although biopsy showed no neoplasia (n = 6), or the referring doctor correctly interpreted the lesion (lipoma), but the outside pathologist incorrectly reported adenoma (n = 1).

Conclusions
Endoscopists at tertiary centers should expect referrals to clarify the nature of colorectal lesions as neoplastic or non-neoplastic. Community endoscopists with equivocal endoscopic findings and unexpected or equivocal pathology results can consider pathology review at their center or at an expert center before referral for endoscopic or surgical resection.
Introduction

Anecdotally, normal endoscopic structures in the colorectum such as the ileocecal valve, as well as abnormal but non-neoplastic lesions such as lipomas, mucosal prolapse, and granulation tissue may be incorrectly interpreted as neoplasms requiring resection. In cases of endoscopist uncertainty, these areas may undergo endoscopic biopsy. If biopsies show no neoplasia, the endoscopist may be reassured. However, in cases of continued endoscopic uncertainty, or if biopsies are read by pathology as neoplastic tissue, there may be an attempt at endoscopic or surgical resection or referral to an expert endoscopist or surgeon for resection. In this report, we describe cases involving endoscopic misinterpretation and, in some cases, incorrect readings by pathologists which lead to referrals for endoscopic or surgical resection.

Methods

Since 2000, we prospectively maintained a database of colorectal lesions $\geq 20$ mm in size that underwent endoscopic resection at our center. Beginning in August 2019, we kept a database for all referred lesions, regardless of size, and regardless of whether endoscopic resection at our center was undertaken. The latter database was used to identify cases in this report. Permission to review the database was granted by the Institutional Review Board at Indiana University on October 5, 2021.

We identified cases referred for endoscopic resection from August 12, 2019 to March 1, 2022 in which errors in endoscopic or pathology interpretation or both led to a referral to our center for endoscopic resection. Cases were included if the referred lesion proved to be non-neoplastic and
not clinically warranting resection at our center, based on endoscopic assessments by the expert at our center, in combination with review of outside pathology by expert GI center and/or biopsies of the referral lesion at our center. In 2020 there was a gap of 3.5 months (mid-March through June) where data was not collected because research assistants were not allowed in the endoscopy units due to of the COVID-19 pandemic. Thus, the study period involved 26 months. In some cases, additional biopsies of the area in question were performed at our center, and in some cases pathologic slides from the referring center were reviewed (before or after the procedure at our center).

All statistics are descriptive.

Results

Exclusions and inclusions

During the 26 month study interval, 760 patients with 897 lesions were referred to the senior author for endoscopic resection of one or more colorectal lesions. Mean age was 64.84 years and there were 401 (52.8%) males. For this report we excluded 732 (96.3%) patients, primarily because they were referred with a lesion that was identified and resected at our center. A full description of the excluded patients is given in the Supplementary Material. Thus, there were 28 patients (3.7% of all referred patients) with 29 lesions included in the study, because they were referred for resection of at least one lesion that was ultimately determined to be non-neoplastic at our center and to not warrant resection. Two of these patients had two referred lesions, one of which was excluded (removed at our center) and the second was included.
Referrals associated with both endoscopic and pathology misinterpretations

Table 1 lists features of 12 cases (1.6% of all referrals) referred for endoscopic consultation that involved errors in both endoscopic assessment and pathology interpretation at the referral center. In each case, the lesion was determined at our center to not be precancerous lesion and to not warrant either endoscopic or surgical resection. Four cases (Table 1, Cases 1-4) involved interpretation of either normal features of the ileocecal valve or a lipoma on the ileocecal valve (ICV). One other case involved a lipoma (Table 1, Case 5), for which biopsy at the outside center was incorrectly interpreted as hyperplastic polyp. Biopsies at our center showed mucosal prolapse changes on the surface of the lipoma, as did review of the outside pathology slides at our center. Two other cases also involved mucosal prolapse. One was incorrectly identified as a mass by the referring endoscopist (Table 1, Case 6; Figure 1a), and incorrectly identified as an adenoma by the referring pathologist (Figure 1b). The other was described by the referring physician as a 2-2.5 cm white flat area seen on retroflexion in the rectum (Table 1, Case 7; Figure 2). Biopsy revealed adenoma at the referring center. At our center the endoscopic changes were resolved, and these biopsies were read as “fibrous and reactive epithelial change.” Review of slides from the outside hospital at our center revealed mucosal prolapse.

Two cases involved the referring endoscopist describing vague mucosal abnormalities. One case was described as mildly nodular mucosa in the cecum over 3-4 cm (Table 1, Case 8). The referring pathologist identified “adenomatous change” in the biopsy. At our center, the cecum
appeared endoscopically normal. Review of the outside biopsies at our center demonstrated normal colonic mucosa (Figure 3). The other involved “congested mucosa” in the ascending colon (Table 1, Case 9). Biopsies at the outside hospital were read as tubular adenoma. At our center no lesions were seen, and review of the outside pathology showed normal mucosa.

Two cases involved an area of granulation tissue and ulceration. In one (Table 1, Case 10; Figure 4a), interpreted as a mass by the referring endoscopist and by the pathologist at the outside center as an adenoma. This case was referred to a colorectal surgeon at our center for right hemicolecction. The surgeon forwarded the endoscopic photographs to the senior author, who interpreted them as ulceration and granulation tissue and recommended review of the outside pathology. This review showed primarily granulation tissue (Figure 4b), with an area of reactive atypia (Figure 4c). A repeat colonoscopy was performed at our center after a period of abstinence from nonsteroidal anti-inflammatory (NSAID) use. There was complete healing of the area in the right colon, and no additional biopsies were taken. The patient was instructed to remain off NSAIDs. The second case (Table 1, Case 11) involved a large inflammatory polyp in the transverse colon interpreted as a “mass” by the referring physician. At our center the lesion appeared to be a large inflammatory polyp, which was confirmed by biopsy at our center and by review of the outside pathology.

The final case (Table 1, Case 12) involved many polyps throughout the colon which were biopsied at the referring center and interpreted as hyperplastic polyps. The patient was considered to have Type 2 Serrated Polyposis Syndrome. At our center the lesions appeared to be
very prominent lymphoid follicles with clear centers, and lymphoid hyperplasia was confirmed by biopsy at our center and review of outside pathology.

*Referrals associated with endoscopic misinterpretations alone*

There were 15 additional cases where a polyp was identified endoscopically at the referring center, but biopsy of the lesion at the referring center demonstrated no neoplasia (n = 6) or no biopsy had been taken (n = 9).

Of the six lesions that had undergone biopsy at the referring center, one was a nodule of granulation tissue in a transverse colon tic (Figure 5a), confirmed by biopsy as both the referring center and our center. A second was described as residual polyp tissue on an endoscopic mucosal resection (EMR) scar at the referring center, but biopsy was normal. At our center, the scar demonstrated clip artifact but no residual adenoma. A third was described at the referring center as a 10 cm segment in the sigmoid colon with multiple equivocal polyps. Biopsy of the area demonstrated fragments of hyperplastic tissue. The area was marked with tattoos at the proximal and distal ends. Multiple passes through the segment between the tattoos at our center demonstrated no endoscopic abnormality. A fourth involved a 1.5 cm polyp at an ileocolonic anastomosis, and biopsy at the referring center had demonstrated normal small bowel mucosa. At our center, there was a polyp of normal-appearing small bowel mucosa surrounding a retained suture (Figure 5c). Repeat biopsies confirmed normal small bowel mucosa. The fifth and sixth lesions involved a right colon lipoma and sigmoid mucosal prolapse, both interpreted as polyps by the referring endoscopist.
There were nine cases where no biopsy was taken at the referring center, and no neoplastic lesion could be confirmed at our center. One of these involved a polyp in a sigmoid diverticulum, confirmed as granulation tissue by biopsy at our center (Figure 5b). A second involved nodular mucosa in the cecum between the appendiceal orifice and ileocecal valve. The endoscopic photographs taken at the referring center suggested inflammatory change. At our center, the area was well demonstrated, and the inflammatory change had largely resolved, and biopsies were negative for neoplasia. A third case involved a prominent ileocecal valve found to be normal at our center. A fourth case of a “3-4 cm” polyp was confirmed as lipoma at our center. Five other cases involve suspected polyps. The language in these cases suggested uncertainty about the presence of a polyp via terms such as “suspected polyp,” “probable polyp,” “area of mucosal abnormality.” Three of the five reports indicated difficulty with accessing the lesion because of tortuosity or loop formation, and none of the four cases involved either partial snare resection, biopsy, or tattoo. In all five cases, cecal intubation was achieved at our center with a stable and short scope, and the region of abnormality was examined 4-6 times using exposure devices such as the Olympus distal attachment, Endocuff Vision, and in both forward and retroflexed views, and no lesion was identified.

**Correct interpretation by the referring endoscopist but error by the outside pathologist**

In one case the outside endoscopist diagnosed a lipoma but biopsy was read as adenoma. At our center no adenoma was visible on any surface of the lipoma. Review of the outside pathology was interpreted as normal at our center.
Discussion

In this report, we describe 28 patients referred to a tertiary center for endoscopic or surgical resection as a result of endoscopic interpretations or pathology readings or both at a referring center that indicated or suggested neoplasia, but reevaluation at our center established that no neoplastic lesion was present. These cases constituted 3.7% of referrals for endoscopic resection to our center during this interval.

We consider these cases appropriate referrals, since from the referring endoscopist’s perspective, there may be times where there is uncertainty as to the presence of a discrete lesion, and assistance in sorting the issue from an expert endoscopist is warranted. Further, if biopsies are taken and interpreted incorrectly as neoplasia by the local pathologist, referral to an expert center to sort the situation can be helpful. Endoscopists at expert centers should be aware that these referrals occur. Endoscopists in the community who identify equivocal endoscopic findings and then get biopsy reports of dysplasia that are unexpected or use equivocal language (see Table 1) should consider discussion of the findings with their pathologist and reassessment of the pathologic diagnosis, as well as obtaining pathology consultation from an expert pathologist, before referral to another endoscopist or surgeon. In some cases, equivocal mucosal changes could be resolved with the assistance of a more experienced endoscopist. Use of a colonoscope with high definition, optical magnification, and/or electronic chromoendoscopy could allow better characterization. In general, inability to define mucosal changes as a discrete lesion on polyp versus another mucosal abnormality or variant should be rare. In one case in our series the patient was referred to us from one of our colorectal surgeons who had received a consult for
surgical resection. It’s possible that many patients undergo operations in the U.S. for these
combined errors of endoscopy or endoscopy and pathology interpretation.

We describe 13 cases where a referral was precipitated in part by an incorrect reading of
neoplasia by a pathologist at a referring center. We have previously shown that pathologic
interpretation of colorectal polyps in community centers has significant inaccuracies in several
regards[1]. In particular, atypical polyps such as mucosal prolapse, inflammatory polyps, and
hamartomas, are frequently misinterpreted by community pathologists as adenomas[1].
Endoscopists at referral centers should be aware of this possibility, particularly when endoscopic
features are not consistent with reported pathology findings. When there is inconsistency
between the pathology findings from the referring center and the endoscopic findings, review of
the pathology by the original pathologist and/or a gastrointestinal pathologist at the referral
center is often the best course of action, and often leads to resolution of the discrepancy.

In some cases in this series, normal mucosa at the referring center was interpreted as hyperplastic
polyp. Because there is large interobserver variation between pathologists in differentiation of
hyperplastic polyps from sessile serrated lesions[2, 3], and because some centers have reported
to never describe sessile serrated lesions[4], referral of large lesions described as hyperplastic
polyps for resection is clinically warranted, since they could represent large sessile serrated
lesions. However, in the cases in this series, the lesions referred as hyperplastic polyps proved to
be neither hyperplastic polyps nor sessile serrated lesions. This was a relatively common source
of the errors encountered in our series (Table 1).
We found that endoscopic locations and lesions that were sources of endoscopic misinterpretation included the ileocecal valve, lipomas, mucosal prolapse changes, granulation tissue in diverticula, and clip artifact on EMR scars. We previously reported the frequency of granulation tissue in diverticula\[5\] and clip artifact at follow-up after clip closure of EMR defects\[6\]. Our series show that both of these features can cause diagnostic confusion.

Endoscopists at referring centers should not take biopsies when lesions that are endoscopically definite and benign are detected and planned for referral to endoscopic resectionists. Further, tattoos should be prevented from extending under lesions. These steps are intended to avoid unnecessary creation of submucosal fibrosis that could make subsequent endoscopic resection more difficult\[7-9]\]. However, our cases suggest that in the setting of equivocal endoscopic abnormality, biopsy that demonstrates no dysplasia could prevent unnecessary referral. When referral does occur for equivocal lesions, tattoo could help ensure that the endoscopist at the referral center thoroughly examines the region in question.

In conclusion, expert endoscopists at tertiary centers should be aware of referrals for misinterpreted endoscopic findings, sometimes combined with inaccurate pathologic interpretation at referral centers. In our experience, misinterpreted endoscopic findings, with or without misinterpreted histology, accounted for 3.7% of 760 consecutive referrals. General endoscopists should be aware that equivocal or uncertain endoscopic findings may be interpreted as dysplasia or hyperplastic polyp by pathologists. If the pathologic interpretation is unexpected or used equivocal language (see Table), reassessment by the interpreting pathologist or consultation with an expert pathologist may avert unnecessary referral for resection. Experienced
endoscopic assessment of such lesions (to establish that reported pathology from outside centers and the endoscopic appearance are consistent), combined with reinterpretation of the pathology findings when appropriate, can resolve these discrepancies and avoid inappropriate therapy for non-neoplastic lesions.
References


Figure legend

Figure 1a. Endoscopic photo of the rectum in Case 6, described as a mass by the referring physician.

Figure 1b. Higher magnification view of Case 6 showing some irregularity to the colonic glands due to the prominent fibromuscular hyperplasia in the lamina propria- all features of mucosal prolapse. In other foci there was an erosion with some acute inflammation. No dysplasia is present.

Figure 2. Endoscopic photograph taken by the referring colonoscopist (Table Case 7).

Figure 3. Outside biopsy of Case 7 showing an intact colonic architecture with no evidence of dysplasia- basically normal colonic mucosa.

Figure 4a. Endoscopic photograph from the referring endoscopist of Case 10 described as a mass. Recognized at our center as granulation tissue.

Figure 4b. Two fragments from the colon biopsy, the left fragment showing granulation tissue consistent with an ulcer, the right fragment showing inflammatory changes.

Figure 4c. Higher magnification of the inflamed fragment showing some surface epithelial crowding, hyperchromasia, and pseudostratification consistent with reactive atypia rather than dysplasia.
Figure 5. Non-neoplastic lesions referred for endoscopic consultation and possible resection.

5a. Mound of granulation tissue in the hepatic flexure

5b. Granulation tissue in a sigmoid tic

5c. Mound of small bowel mucosa surrounding an embedded suture (green material)
Supplementary Material. Patients and lesions excluded and included in the study

During the 26 month study interval, 760 patients with 897 lesions were referred to the senior author for endoscopic resection of one or more colorectal lesions. Mean age was 64.8 years and there were 401 (52.8%) males. For this report we excluded 732 (96.3%) patients. Thus, there were 28 patients (3.7% of all referred patients) with 29 lesions included in the study, because they were referred for resection of at least one lesion that was ultimately determined to be non-neoplastic at our center and to not warrant resection. Two of these patients had two referred lesions, one of which was excluded (removed at our center) and the second was included.

Resection of lesions at our center was the main factor leading to exclusion. Resection of lesions was performed by endoscopy in 667 patients, of whom 661 (including 3 cancers) had neoplastic and 6 non-neoplastic lesions (mucosal prolapse n = 2; inflammatory polyp n = 2; leiomyoma n = 1; submucosal angiolipoma n = 1). Forty-six patients were referred for surgery, entirely for submucosally invasive cancer identified before or after endoscopic resection. In one patient with a benign lesion, observation was recommended by our center. There were 17 patients and 18 lesions excluded because their endoscopic resection was not attempted or incomplete for various reasons (Supplementary Table 1). Lesions located in or adjacent to the appendiceal orifice included both sessile serrated lesions (n = 2) and conventional adenomas (n = 5). The remaining 11 lesions were conventional adenomas except for one gastrointestinal stromal tumor and one region of gastric heterotopia. These patients were also referred for surgery. One of the conventional adenomas considered endoscopically unresectable at our center was demonstrated to contain invasive cancer by surgical resection.
Nine patients were excluded in which the referring physician indicated they had performed resection at their center, but were concerned that the resection had been incomplete, preferred that the follow-up examination be performed at our center, and at our center a scar was identified with no residual polyp.

Three further cases were excluded in which no discrete lesion was identified at our center, but review of pathology slides from the referral center confirmed a neoplasm or hyperplastic polyp. One case involved changes on the ileoceleal valve considered to be possible polyp by the referring physician, and one biopsy showed tubular adenoma. At our center, no lesion was identified on the ileoceleal valve, and extensive biopsies from all quadrants of the valve demonstrated no adenoma. Review of the outside pathology demonstrated what appeared to be two adenomatous glands in one biopsy fragment. We considered that a tiny adenoma had been removed by prior biopsy and advised the patient to repeat colonoscopy in 5 years. The second case involved a 2 x 3 cm area at 18 cm from the anal verge in the sigmoid colon for which “random biopsies were obtained.” Pathology reported hyperplastic polyp. At our center, multiple passes were made through the sigmoid colon and no lesion could be identified. Multiple biopsies were obtained from this area which were interpreted by our pathologist as “colonic mucosa with surface hyperplastic changes.” Review of the original pathology at our center confirmed hyperplastic polyp. The patient was advised to undergo repeat colonoscopy at the referring center in one year. The third case involved an area in the right colon with mucosal abnormality. Biopsy by the referring doctor showed hyperplastic polyp. At our center no discrete polyp was seen and repeated biopsy showed “focal hyperplastic change.” The patient was instructed to undergo
repeat colonoscopy at our center in one year. At the 1 year follow-up the right colon appeared normal in multiple endoscopic passes in white light and narrow band imaging.

In total, 9 patients were excluded for more than one reason.
<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extends into the appendiceal orifice</td>
<td>6</td>
</tr>
<tr>
<td>Adjacent to lesion that extends to appendiceal orifice and will be part of surgical specimen</td>
<td>1</td>
</tr>
<tr>
<td>Difficult Location/Access</td>
<td>3</td>
</tr>
<tr>
<td>Fibrotic/Ulcerated/ Didn’t Lift</td>
<td>5</td>
</tr>
<tr>
<td>Submucosal</td>
<td>1</td>
</tr>
<tr>
<td>Heterotopic gastric mucosa not amenable to endoscopic resection</td>
<td>1</td>
</tr>
<tr>
<td>Perforation during resection</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

Supplementary Table 1. Eighteen lesions in 17 patients excluded from study because lesion was not resected at our center.
Table 1. Twelve cases where errors in interpretation by both the outside endoscopist and pathologist led to referral to our center

<table>
<thead>
<tr>
<th>Case number</th>
<th>Endoscopic finding at referral center</th>
<th>Pathology reading at referral center</th>
<th>Endoscopic finding at our center</th>
<th>Pathology finding at our center</th>
<th>Review of outside pathology at our center</th>
<th>Comment(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Erythematous, irregular nodular, inflamed thickened ICV</td>
<td>Hyperplastic polyp</td>
<td>Normal ICV</td>
<td>Normal</td>
<td>Enteric and colonic mucosa with mild acute inflammation, small bowel fragments</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4 cm broad polyp on ICV</td>
<td>Hyperplastic polyp</td>
<td>Lipoma on ICV</td>
<td>Normal</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Fatty ICV polyp versus polyp</td>
<td>Focal features suggestive of focal early tubular adenoma</td>
<td>7 mm cyst on ICV orifice</td>
<td>Cyst: normal mucosa with dilated lacteals</td>
<td>Normal mucosa</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Focal thickened prominent mucosa ICV</td>
<td>Hyperplastic polyp</td>
<td>Normal ICV</td>
<td>Normal</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4-5 cm pedunculated sigmoid colon mass, partly obstructing</td>
<td>Hyperplastic polyp</td>
<td>Large sigmoid lipoma</td>
<td>Mucosal prolapse</td>
<td>Mucosal prolapse</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5 cm mass in rectum</td>
<td>Adenomatous polyp</td>
<td>Multiple rectal ulcers consistent with solitary rectal ulcer syndrome</td>
<td>Mucosal prolapse</td>
<td>Mucosal prolapse</td>
<td>Patient underwent sigmoid resection and rectopexy</td>
</tr>
<tr>
<td>7</td>
<td>2-2.5 cm white area in rectum on</td>
<td>Adenoma</td>
<td>Changes resolved</td>
<td>Fibrosis with reactive</td>
<td>Mucosal prolapse</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Epithelial Change</td>
<td>Biopsies Taken</td>
<td>Mucosa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>---------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Mildly nodular mucosa in cecum over 3-4 cm might be normal variant cannot exclude flat polyp</td>
<td>Adenomatous change</td>
<td>No lesion</td>
<td>No biopsies taken</td>
<td>Normal mucosa</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Congested mucosa ascending colon</td>
<td>Tubular Adenoma</td>
<td>No lesion</td>
<td>No biopsies taken</td>
<td>Normal mucosa</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Mass proximal ascending colon one-third to one-half circumference; 4-5 cm; worrisome for cancer</td>
<td>Tubular adenoma</td>
<td>Review of outside photos: ulcer with granulation Repeat colonoscopy at our center → scar consistent with healed ulcer</td>
<td>No biopsies taken</td>
<td>Granulation tissue; 4-5 glands that are “indeterminat e for dysplasia”, possibly reactive</td>
<td>Patient advised to stay off NSAIDs</td>
</tr>
<tr>
<td>11</td>
<td>Transverse colon mass with adjacent polyps</td>
<td>Tubular adenoma</td>
<td>Review of outside photos: Inflammatory mass and adjacent inflammatory polyps</td>
<td>Inflammatory polyps</td>
<td>Inflammatory polyps</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Multiple small polyps</td>
<td>Hyperplastic polyps</td>
<td>Lymphoid hyperplasia</td>
<td>Lymphoid hyperplasia</td>
<td>Lymphoid hyperplasia</td>
<td></td>
</tr>
</tbody>
</table>

ICV: ileocecal valve  
cm: centimeter  
mm: millimeter