A 21-year-old monk presented with chronic diarrhea and significant weight loss for 8 months. Stool exam revealed numerous RBC and WBC. Stool test for acid fast bacilli was negative. Colonoscopy showed multiple large transverse ulcers with exudates from the ascending colon to descending colon (Figure 1-2). Barium enema revealed multiple segments of mucosal irregularity and ulceration of the entire colon, with extension to involve ileocecal valve and terminal ileum (Figure 3-4). Chest radiograph showed reticulonodular infiltration of the right lung, predominantly on the upper lobe (Figure 5). Sputum for acid fast bacilli stain was positive. Computed tomography of the abdomen revealed multiple segments of thickened bowel wall, involving sigmoid colon up to cecum and terminal ileum (Figure 6-7). The degree of wall thickening is more on the right side. Several necrotic mesenteric nodes were present (Figure 8-9).
Figure 1: Descending colon (Transverse ulcer)
Figure 2: Large ulcer with exudates
Figure 3: Barium enema showed mucosal irregularity of transverse and ascending colon
Figure 4: BE showed mucosal irregularity of cecum and IC valve
Figure 5: Chest X-ray showed reticulonodular infiltration of the right upper lung
Colon biopsy showed numerous acute and chronic inflammatory cells infiltrating the lamina propria, forming vague granulomas with ulcerated surface. The remaining mucosa displayed cryptitis and crypt abscesses. These crypts were lined by reactive epithelium (Figure 10-11). Tissue for acid fast bacilli stain and PCR for tuberculosis were negative.
Diagnosis:
Disseminated mycobacterium tuberculosis

Discussion:
Digestive system is one of the sites for extrapulmonary tuberculosis. The digestive system is involved in 66% of patients with abdominal tuberculosis. The ileocecal region is the most commonly affected within the gastrointestinal tract followed by the colon. In colonic involvement, the cecum and ascending colon are most commonly affected, followed by the transverse and descending colon. Autopsies of patients with pulmonary tuberculosis before the era of effective treatment demonstrated intestinal involvement in 55-90% of fatal cases. Direct infection from the wall of the gut is highly possible after drinking unpasteurized milk or swallowing a large number of bacilli from the pulmonary cavity. Reactivation from the body within few years after hematogenous spreading is also a possible mode.

Tripathi and Amarapurkar studied 110 cases of TB in the GI tract to identify the morphologic spectrum of the disease. The most common clinical presentations were abdominal pain (82.7%), fever (58.2%), weight loss (53.6%), and diarrhea (29.1%). Concurrent involvement of the ileum, cecum and ascending colon were seen most frequently in 56 cases (50.9%). The next most common site of involvement was the terminal ileum alone, in 43 cases (39.1%). Common colonoscopic findings were ulcers (70%), nodules (56%), deformed cecum and ileocecal valve (40%), strictures (23%), polypoid lesions (14%), and fibrous bands forming mucosal bridges (7%).

References
Case 2

Tanassanee Soontornmanokul, M.D.
Satimal Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 67-year-old woman presented with intermittent hematochezia for a year. She had been diagnosed with a locally advanced cervical cancer and had undergone external radiation for 5 years. She underwent a sigmoidoscopy. Endoscopic findings showed (Figure 1-5).

Figure 1-4: Demonstrating neovascularization with bleeding secondary to radiation injury
Figure 5: Demonstrating an argon plasma coagulation to ablate the abnormal neovascularization that caused bleeding.

**Diagnosis:**
Radiation induced colitis

**Discussion:**
Radiation induced proctocolitis is a well-known complication of pelvic irradiation, usually develops within the first year after radiotherapy. Rectal bleeding is the most common presenting symptom, and may lead to iron deficiency anemia requiring blood transfusions. Chronic radiation exposure results in varying degrees of neovascular formation over the intestinal mucosa. Generally, the endoscopy shows diffuse hemorrhagic or hyperemic mucosa with telangiectasias. Occasionally there may be circumferential ulcers with a relatively sharp proximal and distal demarcation. Although most cases of bleeding radiation induced proctocolitis resolve spontaneously, the management may be difficult in severe cases. Argon plasma coagulation (APC) appears to be a simple, safe, and effective to manage this condition, and generally accepted as the treatment of choice. Recent prospective series showed that the success rate was 98.5% after a median of the 2 treatment sessions, and there were no significant side effects.

**References**
Case 3

Kanita Chattrasophon, M.D.
Satimai Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 48-year-old woman presented with bloody diarrhea and polyarthralgia. She has been diagnosed with Crohn’s disease (CD) for 10 years. She was treated with 6-mercaptopurine. One month prior to admission, she developed bloody diarrhea and polyarthralgia. Colonoscopy showed circumferential ulceration with severe inflammation (Figure 1-2) causing a narrow colonic lumen at 5 cm from the anal verge (Figure 3-4).

Figure 1-2: Circumferential ulceration with severe inflammation

Figure 3-4: Severe mucosal inflammation causing luminal stricture
Diagnosis:
Active Crohn’s disease with rectal stricture

Discussion:
Non-fistulizing perianal lesion, including ulcerations, stricture and anal carcinoma are observed in Crohn’s disease. Stricture occurs as consequence of chronic inflammation or fistula can be found in anus (34%) and rectum (50%)\(^1\). The presentations are bloody diarrhea, constipation, perineal pain, and fecal incontinence. Although these patients have usually a moderate degree of stenosis, they are asymptomatic. However, in a case with severe stenosis, the clinically intestinal obstruction usually presents. There are 2 types of rectal and anal stricture for CD. Rectal stricture type 1, inflammatory stenosis results from anal spasm can be relaxed and opened easily under anesthesia, but in the rectal stricture type 2, the stricture develops from scarring tissue\(^2,3\).

References
A 25-year-old man presented with chronic diarrhea and fistula in ano for 6 months. Physical examination showed an opening of perianal fistula with discharge (Figure 1). He underwent colonoscopy. Colonoscopy showed an internal opening of fistula near anal canal (Figure 2) and a deep ulcer in the rectum (Figure 3) with inflammatory pseudopolyp (Figure 4). Biopsy showed moderate lymphoplasmacytic infiltration in edematous lamina propria and mildly distorted dilated crypts lined by hyperplastic epithelium consistent with inflammatory pseudopolyp. Biopsy tissues were negative for acid fast bacilli and no inclusion body was found. PCR for *Mycobacterium tuberculosis* was also negative.
Diagnosis:

Active Crohn’s disease with perianal fistula

Discussion:

Perianal fistula is an abnormal connection between the anal canal and skin. Incidence in Crohn’s population are varies form 17-43%\(^1\). Fistula occurred in 35% over time. Of those fistulas, 54% are perianal types, 24% are entererenteric fistulas, 9% are rectoanal fistulas and 13% are miscellaneous fistulas such as enterocutaneous, enterovesical, and intraabdominal fistulas\(^2\). Perianal fistula could be as an initial presentation of Crohn’s disease and preceding intestinal symptoms for years. The symptoms are persistent anal pain, painful defecation, and perianal purulent discharge. Fistulas are classified in 2 types.

1) Simple fistula is defined as a fistula located below the dentate line, single external opening, painless with no rectoanal fistula and no anorectal stricture.

2) Complex fistula is defined as a fistula located above the dentate line with multiple openings, and/or with abscess formation, and/or with rectoanal fistula, and/or with anorectal stricture\(^3\).

References

A 70-year-old woman presented with recurrent hematochezia. She had been diagnosed with dilated cardiomyopathy. She underwent flexible sigmoidoscopy. The endoscopic findings showed a visible vessel surrounded with normal mucosa in the rectum at 5 cm from the anal- verge (Figure 1). After an injection of diluted epinephrine, Argon plasma coagulator (APC) was applied at the lesion. The pulsatile bleeding occurred during applied APC. Hemostasis was achieved successfully (Figure 2-4).
Diagnosis:
Rectal Dieulafoy’s lesion

Discussion:
Rectal Dieulafoy’s is an unusual source of rectal bleeding. Clinical course can be either intermittent or massive rectal bleeding. Majority of Dieulafoy’s lesion occur in a lesser curvature of stomach within 6 cm of the gastroesophageal junction. Several effective endoscopic treatment of rectal Dieulafoy’s had been reported such as combination of epinephrine injection and coagulation therapy, application of a Hemoclip, and APC.

References
Case 6

Kittiyo Poovorawan, M.D.
Satimai Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 59-year-old woman presented with mucous bloody diarrhea for a year. She had no fever and no weight loss. Stool examination, stool culture, and stool test for *C. difficile* toxin assay were negative. Subsequently, she underwent colonoscopy. Colonoscopy revealed diffuse erythema, friable mucosa with ulceration and mucosal bridge of the entire colon (Figure 1-2). The terminal ileum was normal. Biopsy showed chronic colitis consistent with ulcerative colitis. Her clinical conditions improved significantly after corticosteroids treatment.

**Diagnosis:**
Active severe ulcerative colitis

**Discussion:**
Ulcerative colitis (UC) is immunologically mediated disease characterized by chronic colonic mucosal inflammation. Mucosal bridging, characterized by bridging of regenerative mucosal tissue from one wall to an adjacent wall, occasionally found in UC\(^1\). This condition carries no malignant potential and can be found in other colitis conditions including ischemic colitis, infective colitis, and colonic tuberculosis\(^2\).

**References**

![Figure 1: Diffuse erythema, friable mucosa with ulceration, and mucosal bridge of the entire colon](image1)

![Figure 2: Diffuse erythema, friability of the mucosa with multiple ulcers under white light image (A), Under FICE station 8 (B), Under FICE station 4 (C), Under FICE station 6 (D)](image2)
A 52-year-old man presented with bowel habit change. He had bloody diarrhea and anemia for a month. He lost weight about 5 kgs. Computed tomography of the abdomen demonstrated circumferential thickened wall of the hepatic flexure of colon, about 5.4 cm in length, associated with minimal pericolonic fat stranding, suggestive of carcinoma (T3) (Figure 1). Colonoscopy revealed a circumferential ulcerative mass with friable mucosa and easily contacts bleeding at transverse colon. The colonic lumen was narrowed but scope could pass through this lesion (Figure 2-3). Biopsy of the lesion showed complex neoplastic sheets with occasional glandular formation associated with desmoplastic reaction. Those lining cells contained markedly pleomorphic nuclei. The diagnosis was well-differentiated adenocarcinoma (Figure 4).
Diagnosis:

Colon cancer (well-differentiated adenocarcinoma)

Discussion:

Colon cancer is the second leading cause of cancer death in men and the third leading cause in women in the United States. Since the 1980s, there has been a persistent trend in the increasing percentage of right-sided colon cancers, and decreasing percentage of left-sided and sigmoid colon cancers.

During embryologic development, the right colon (cecum, ascending colon, proximal two-thirds of the transverse colon) arises from the midgut and the left colon (distal one-third of the transverse colon, descending and sigmoid colon, rectum) arises from the hindgut. This difference is reflected in the dual blood supply. Right-sided colon cancers (RCCs) are typically bulky, exophytic, polypoid lesions projecting into the lumen and causing significant anemia. Left-sided colon cancers (LCCs) are infiltrating, constricting lesions encircling the lumen, often leading to obstruction.

Accumulating evidence suggests that the risk of colorectal cancer is different for proximal and distal tumors. White light endoscopy is generally enough to detect the circumferential colon cancer, however FICE may be able to depict additional abnormal vasculatures related to neoplasm.
References


Case 8

Tanassanee Soontornmanokul, M.D.
Satimai Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 56-year-old man with compensated HBV cirrhosis underwent colonoscopy for an indication of iron deficiency anemia. He had no previous history of visible gastrointestinal bleeding. EGD revealed severe portal hypertensive gastropathy, esophageal, and gastric varices without any stigmata of recent bleeding. Colonoscopic findings showed a tortuous dilated vein extending from the anus to lower rectum without red color sign (Figure 1-4).

![Figure 1: White light image](image1)

![Figure 2: FICE station 4](image2)

![Figure 3: FICE station 2](image3)

![Figure 4: FICE station 6](image4)
Diagnosis:
Non-bleeding rectal varices

Discussion:
Rectal varices are collateral vessels that connect the superior hemorrhoidal veins (inferior mesenteric and portal circulation) with the middle and inferior hemorrhoidal veins (pudendal vein and systemic circulation). The prevalence of anorectal varices in patients with portal hypertension was 40-77%\(^1\) with minimal risk of significant bleeding. However, bleeding from rectal varix could be fatal\(^2\). Rectal varices often coexist with hemorrhoids and must be distinguished from each other by their endoscopic characteristics, i.e. varices usually extend from the anal canal into the rectum, whereas hemorrhoids are confined to the anal canal\(^2\). At present, there are still no evidence-based guidelines on the management of rectal varices. A case series of successful endoscopic band ligation and endoscopic injection sclerotherapy with N-butyl-2-cyanoacrylate of bleeding rectal varices were reported\(^2\)\(^3\), but the results were controversial and needed further controlled prospective studies. Recently, Weilert F, et al. reported the using EUS-guided therapy with embolization coil and glue injection to control bleeding rectal varices\(^4\).

References
Case 9

A 46-year-old man with a history of bowel resection secondary to severe Crohn’s disease, presented with recurrent RLQ abdominal pain and palpable mass. CT whole abdomen showed circumferential wall thickening of the ileocecal region without lymphadenopathy (Figure 1-2). A recurrent Crohn’s disease with ileocolic obstruction was clinically entertained. Right hemicolectomy with ileocolicectomy was performed. Histopathology showed chronic colitis with crypt distortion and crypt atrophy without any organism (Figure 3-4).

Figure 1-2: Circumferential wall thickening of the ileocecal region (yellow arrow)

Figure 3: Crypt distortion and crypt atrophy

Figure 4: Fissure ulcers with transmural colitis
Post operation, the patient was treated with corticosteroids and azathrioprine. A follow-up colonoscopy at 4 months later revealed a large anastomotic ulcer with normal mucosa at the neo-terminal ileum (Figure 5-6).

**Diagnosis:**
Post-operative recurrent Crohn’s disease with anastomotic ulcer

**Discussion:**
About 80% of patients with Crohn’s disease required surgery at some stage of the disease. Post-operative recurrence was almost unavoidable in the absence of treatment. The rate of recurrence is about 65-90% within 12 months, and 80-100% within 3 years after the operation\(^1\). An ileocolonoscopy is the gold standard for diagnosis of post-operative recurrence; therefore, it should be performed within the first year after surgery. Prophylactic treatment is recommended after small intestinal resection. A meta-analysis of the four controlled trials has shown that thiopurines were more effective than mesalazine or imidazole for preventing both clinical and endoscopic recurrence at 1-2 years\(^2\). Prophylaxis is recommended to be started within two weeks after surgery, and should be continued for at least 2 years.

**References**
A 19-year-old woman presented with chronic watery diarrhea and significant weight lost for 6 months. She had been in excellent health until 6 months ago. Stool ova and parasite examinations revealed no pathogen. Colonoscopy was performed and showed multiple small whitish mobile thin worms with threadlike anterior half, coiled and straight posterior end and penetrating mucosa of cecum (Figure 1-6).

Figure 1-2: A whitish whipworm with obtuse posterior end in cecum (red arrow); was recognized to be female worm under white light mode (A) and FICE station 2 (B).

Figure 3-4: Two whipworms, one at red arrow showed straight posterior end, to be female whipworm and another one at yellow arrow showed coiled posterior end, to be male whipworm under white light mode (A) and under FICE station 2 (B).
Diagram: *Trichuris trichiura* infestation

Discussion:

*Trichuris trichiura* (whipworm) infestation is an endemic in tropical and temperate countries, including Southeast Asia. Most patients are asymptomatic, especially if less than 10 worms or if only males are present, whereas, infestation with larger numbers of worms may cause abdominal pain, diarrhea, weight loss, and anemia. Heavy colonic infection causes syndrome named *Trichuris* dysentery syndrome. Those patients mainly children presented with mucoid diarrhea, rectal bleeding, rectal prolapsed, iron deficiency anemia and clubbing of fingers.

Whipworm is transmitted by feco-oral route and inhabits the human cecum and proximal large bowel. The adult worms have a thin, tapered anterior region. The female worm is 30 to 50 mm in length, has an uncoiled posterior extremity and lays 3,000 to 20,000 eggs per day. The male is slightly smaller, and has a coiled caudal extremity with a copulatory spicule. At the esophageal part of whipworms, there are stichocytes made of number of stichosomes and stichocytes exhibit exocrine granules that contain a variety of excretory and secretory products that may alter host cell physiology to allow the worm to establish parasitism in the host.

Diagnosis of trichuriasis is by the demonstration of brown, barrel-shaped ova in feces. However, in some patients, stool examination could not show ova while colonoscopy could demonstrate whipworm infestation. Colonoscopy usually demonstrates the mobile whitish worm; 30-50 mm in length with threadlike anterior end, which penetration in the mucosa. The worms are most common found in cecum. Surrounding colonic mucosa usually appeared edematous and erythematous but ulceration was not common.

References

A 65-year-old woman presented with chronic mucous bloody diarrhea. She had been diagnosed as extensive ulcerative colitis. She was treated with corticosteroids as an induction to a remission. Azathioprine has been given as a maintenance therapy. Follow-up colonoscopy showed mucosal atrophy, fibrotic scar, and the loss of normal haustral folds, resulting in shortening of the colon and a decrease in luminal diameter (Figure 1-2).

![Figure 1-2: Mucosal atrophy, fibrotic scar, and the loss of normal haustral folds](image)

**Diagnosis:**

Chronic inflammation in long standing ulcerative colitis causing a burn out colitis

**Discussion:**

According to the international organization of IBD, the definition of mucosal healing was absence of friability, blood, erosions, and ulcers in all segment of gut mucosa or disappearance of normal vascular pattern. Remission could be successful in several drugs such as 5-aminosalicylates, steroids, and infliximab. Data from many studies suggested that mucosal healing associated with the better outcomes and predicted the possibility of a long-term remission in ulcerative colitis, especially decreasing the risk of relapse. Forty percent of patients who achieved mucosal healing with oral and rectal steroids did not relapse during 1 year of follow-up compared to 18% of those who did not achieve mucosal healing. Moreover, in a large population-based study reported that UC patients who achieved mucosal healing at 1 year had a lower risk of colectomy at 5 years.
References

Case 12

Tanassanee Soontornmanokul, M.D.
Satimal Aniwan, M.D.
Rungsun Rerknimitr, M.D.
Naruemon Wisedopas-Klaikeaw, M.D.

Asymptomatic 55-year-old man underwent colonoscopy for colorectal cancer screening (Figure 1-2).

Figure 1: White light image (A) and FICE station 0 (B) revealed one sessile colonic polyp at sigmoid colon. With FICE, a large tubular pits pattern (Kudo classification III L) and meshed capillary vessels surrounded mucosal glands (Sano classification II) were displayed. Histopathological examination showed tubular adenoma with low grade dysplasia. (C, D)
Diagnosis:

Colonic tubular adenoma and tubulovillous adenoma

Discussion:

Most of colon cancers originate within previously benign adenomas. Endoscopic discrimination of small adenomas from non-neoplastic polyps is essential, because polypectomy of adenomas can reduce the risk of subsequent colorectal cancer. However, the diagnostic accuracy of conventional endoscopy for colonic polyps that smaller than 5 mm in size was not satisfactory¹. FICE (Flexible Spectral Imaging Color enhancement) developed by Fujifilm Corporation, Tokyo, Japan reported as a new non-dye diagnostic tool for the differentiation of neoplastic polyp from non-neoplastic one¹.² Yoshida, et al. showed that FICE magnification correlated well with the histopathological diagnoses. When compared the FICE reading results with Narrow Band imaging (NBI) reading results, they found that the sensitivity and specificity of the two methods were comparable (77.7 vs. 63.6% and 100% vs. 99%, respectively)³. Therefore FICE magnification for colorectal tumors can be used as a diagnostic tool to predict histology and it is useful to avoid an unnecessary polypectomy.

References

Case 13

Suparat Khemnark, M.D.
Rungsun Rerknimitr, M.D.

A 60-year-old man underwent colonoscopy for colorectal cancer screening. Colonoscopy found a lateral spreading tumor (2 cm in diameter). Biopsy revealed tubular adenoma with focal high grade dysplasia (Figure 1-3). Then colonoscopy with endoscopic mucosal resection (EMR) was performed (Figure 4).

![Figure 1-3: Lateral Spreading Tumor with FICE demonstrate type III pit pattern with mesh capillary Sano pattern II](image)

![Figure 4: Endoscopic mucosal resection technique (A) Initial injection of a saline solution into the submucosal layer to lift the lesion. (B) Snare resection was performed to resect the entire lesion (C) Post EMR](image)

**Diagnosis:**
EMR (Endoscopic Mucosal Resection) in one piece for a 2 cm lateral spreading tumor (non-granular type)

**Discussion:**
Lateral spreading tumors (LSTs) of the colorectum are defined as lesions greater than 10 mm in diameter with a low vertical axis that typically extend laterally and circumferentially rather than vertically along the colonic wall laterally along the luminal wall. The frequency of invasive carcinoma is lower than that of polypoid lesions of similar size.

These lesions can be subdivided into two subtypes based on endoscopic macroscopic findings:
LST-G (granular) type with even or uneven nodules on the surface and LST-NG (non-granular) type with a smooth surface. The previously reported that LST-G with large nodules or depressions tend to invade the submucosal layer, recently a trial reported that LST-NG type has a higher potential for malignancy than LST-G type.

LSTs are usually removed by endoscopic mucosal resection (EMR) but larger tumors may require piecemeal resection. However, LSTs with deep submucosal invasion should not be treated by EMR because of the high risk of lymph node metastasis.

References
Case 14

Kriangsak Charoensuk, M.D.
Phonthep Angsuwatcharakon, M.D.
Rungsun Rerknimitr, M.D.

A 65-year-old man has been diagnosed adenocarcinoma of sigmoid colon and he underwent sigmoidectomy. A colonoscopy for colorectal cancer surveillance was performed 6 months later. Colonoscopy showed a granular lateral spreading lesion (Paris classification 0-IIa) at cecum, 5 cm in diameter (Figure 1-2). “Underwater” endoscopic mucosal resection (UEMR) without submucosal injection was performed (Figure 3-4). Pathological finding revealed tubular adenoma with focal high grade dysplasia.

Figure 1: A granular lateral spreading tumor (LST) (Paris classification 0-IIa)

Figure 2: Pit pattern was Kudo’s classification III and vascular pattern was Sano’s classification II. (FICE station 1)

Figure 3: Underwater EMR with snare without submucosal saline injection

Figure 4: After underwater EMR
Diagnosis:
“Underwater” endoscopic mucosal resection (UEMR) for granular lateral spreading tubular adenoma with focal high grade dysplasia

Discussion:
Endoscopic mucosal resection (EMR) is a well-established method for resecting sessile colon polyps. Submucosal injection has been considered an integral part of the EMR technique. Now there has been a report about a newly developed method of water immersion (UEMR) that eliminates submucosal injection. UEMR enables complete removal of large sessile colorectal polyps without submucosal injection. A Prospective, observational study in 60 consecutive patients referred for resection of large sessile colorectal polyps were treated with UEMR. Complete resection was successful in all patients without early complication. There was no perforation or postpolypectomy syndrome. Delayed bleeding occurred in 3 patients and was managed conservatively. The technique was safe in a large patient cohort, and the early recurrence rate appears low. Use of a water interface for UEMR has potential advantages that deserve further study.

References
Case 15

Nuttaporn Norrasetwanich, M.D.
Satimal Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 66-year-old man with no previous medical illness presented with a 3-day history of bloody diarrhea and lower abdominal pain. One day prior to admission, he developed rectal bleeding. His stool examination demonstrated *Entamoeba histolytica* cysts. Sigmoidoscopy showed multiple discrete small ulcers with thick yellowish exudates and erythema rim. There was normal intervening mucosa along the rectosigmoid colon (Figure 1-3). Colonic biopsy revealed multiple foci of erosion with acute and chronic inflammatory infiltration in the lamina propria. No organism was seen in the submitted tissue. He was treated with 10-day metronidazole. Complete colonoscopy was performed 2 weeks later and it showed a markedly improvement of the lesions (Figure 4-5).
Diagnosis:
Amebic colitis

Discussion:

*E. histolytica* can infect people of both genders and all ages; however, populations at risk may vary with geographic location, host susceptibility, and differences in organism virulence. The simple life cycle of *E. histolytica* begins when infectious cysts are ingested in fecally contaminated food or water. After ingestion and passage through the stomach, the organism excysts and emerges in the large intestine as an active trophozoite. Trophozoites multiply by simple division and encyst as they move further down the large bowel. Cysts are then expelled with the feces and may remain viable in a moist environment for weeks to months.

Amebic colitis may occur days to years after initial infection and is characterized classically by abdominal pain and bloody diarrhea. Watery or mucus-containing diarrhea, constipation, and tenesmus may also occur. Complications of intestinal disease include stricture, rectovaginal fistulas, formation of an annular intraluminal mass (ameboma), bowel obstruction, perianal skin ulceration, toxic megacolon, perforation, peritonitis, shock, and death.

Colonoscopy is useful for the diagnosis of amebic colitis but is not required if stool antigen detection or PCR is positive. Amebic colitis can appear as punctate hemorrhagic areas or small ulcers (up to centimeters in diameter) with exudative centers and hyperemic borders. The cecum and ascending colon are affected most commonly, although in severe disease the entire colon may be involved. In addition, early in the infection process, endoscopy results may be entirely normal. As disease progression occurs, mucosa may become hyperemic due to inflammatory changes, and pseudomembranes can occur, resembling inflammatory bowel disease. Aspirates content from colonic ulcers should be examined immediately microscopically for motile trophozoites.

References
Case 16

Nuttaporn Norrasetwanich, M.D.
Satima Aniwan, M.D.
Rungsun Rerknimitr, M.D.

A 66-year-old woman presented with intermittent bloody stool passage for 3 days. She had no abdominal pain. She had been diagnosed with cervical cancer 1 year previously and treated with pelvic radiotherapy. Colonoscopy revealed multiple twisted submucosal telangiectasia at rectum approximately 10 cm from the anal verge (Figure 1-6).

Figure 1-2: Demonstrated neo-vascularized pattern under white light and FICE station 4

Figure 3-4: A closer look of neo-vascularization under white light and FICE station 4
**Diagnosis:**
Radiation proctitis

**Discussion:**
Irradiation of the pelvic floor due to cervical or prostate cancer leads in about 5–20% of patients to the development of post-radiation rectal telangiectasias. These start to occur and bleed usually several months after radiation injury; in some patients bleeding starts as late as 2 years following irradiation. Radiation-induced mucosal damage results in endothelial dysfunction, microvascular injury with intimal fibrosis, and fibrin thrombi of small arteries and arterioles leading to ischemia, fibrosis and the development of neovascular lesions. The lesions can be better depicted under FICE in this patient.

Chronic radiation proctitis resolves spontaneously in many cases, but in some can lead to persistent rectal bleeding and iron deficiency anemia requiring blood transfusion. Treatment remains unsatisfactory. Medical measures, including formalin application, topical sucralfate, 5-amino salicylic acid enemas, short chain fatty acids, and antioxidants such as vitamin E and pentoxifylline have been used with limited success. Surgical management is associated with high morbidity and mortality. The currently preferred endoscopic method is argon plasma coagulation which provides controlled, superficial, non-contact coagulation of all existing abnormal vessels. It is crucial to apply coagulation very carefully in order to avoid the creation of deeper ulceration in a fragile ischemic mucosa.

**References**
A 20-year-old woman presented with chronic constipation, including excessive straining, and a sense of incomplete evacuation for 4 years. She also had intermittent bloody output per rectum. Colonoscopy revealed a hemi-circumferential anterior wall rectal ulcer size 1.5 cm in diameter at 5 cm from anal verge (Figure 1-4). Biopsy showed benign colonic mucosa with acute organizing ulcer. The colonic glands among the inflammation were distorted and deformed with focal cystic dilatation. Stromal fibrosis was noted. Solitary rectal ulcer was most likely.

Figure 1-2: White light endoscopy revealed a shallowed ulcer at the anterior wall of the rectum

Figure 3-4: White light and FICE station 1 revealed another ulcer with well demarked border
Diagnosis:
Solitary Rectal Ulcer Syndrome (SRUS)

Discussion:
Solitary rectal ulcer syndrome (SRUS) consists of several different clinical pathologic processes. These processes, however, end in a mutual common pathway that is associated with reduced blood perfusion of the rectal mucosa, leading to local ischemia and ulceration. SRUS was described in the early nineteenth century by the French anatomist J. Cruvilhier in his report on chronic rectal ulcer1.

In fact, the name of SRUS is a misnomer, because only 25% to 30% of patients have a solitary ulcer. Certain patients may have multiple ulcers (30%–40%), hyperemic mucosa (15%–20%), or polypoid lesions2. Abid S, et al. reviewed 116 patients diagnosed with SRUS histologically, solitary and multiple lesions were presented in 79 (68%) and 33 (28%) patients respectively; ulcerative lesions in 90 (78%), polypoidal in 29 (25%), erythematous patches in 3 (2.5%) and petechial spots in one patient3. The lesions usually locate on the anterior rectal wall, 4 to 10 cm from the anal verge. Lesions range from 0.5 to 6 cm, although most are 1 to 1.5 cm in diameter. Some ulcers have rolled edges and may bleed, raising concern for a possible malignancy. It is generally a disorder of young adults (third or fourth decade of life), with an incidence of 1 to 3 in 100,000 persons per year. Women are somewhat more prone to develop SRUS than men. Symptoms are nonspecific; rectal bleeding and the passage of mucus are most commonly reported. Straining at stool, feelings of incomplete evacuation, rectal discomfort, and urgency are common2. Despite the diverse causes the microscopic changes are analogous, comprising fibromuscular obliteration and disorientation of the muscularis mucosa1.

References
A 56-year-old man presented with fever and bloody diarrhea for 2 weeks. He had a history of kidney transplantation 2 months ago. He received immunosuppressive drugs; mycophenolate sodium, tacrolimus and prednisolone 10 mg/d. Colonoscopy was performed. It revealed diffuse subepithelial hemorrhage and multiple shallow ulcers extend from sigmoid to terminal ileum (Figure 1-4). Biopsy showed erosive surface and edematous lamina propria. Numerous neutrophils and lymphoplasmacytic cells infiltrated in lamina propria. Many endothelial cells of vessels in lamina propria showed large cells with intranuclear inclusions (Figure 5). The diagnosis was CMV colitis. CMV immunohistological stain was positive in several cells (Figure 6). His serum CMV viral load was 51,800 copies/ml.
**Diagnosis:**
Cytomegalovirus colitis

**Discussion:**
CMV remains the single most important pathogen affecting the outcome of solid organ transplantation. CMV has the direct effects of morbidity and mortality related to infection, but also contributes to a multitude of short and long-term indirect effects mediated by its modulation of the immune system. Luminal tract disease is the most common manifestation. Esophagitis and colitis are the most frequently observed luminal syndromes, usually characterized by ulcerative lesions.

CMV colitis usually manifests with abdominal pain, persistent small-volume diarrhea, and rectal bleeding. Bloody diarrhea or hematochezia are the most common symptoms in immunocompetent patients with CMV colitis. Although a wide spectrum of findings can occur, typical endoscopic findings are mild and patchy to include erythematous colonic mucosa with edema and subepithelial hemorrhage. Less commonly endoscopic findings are discrete ulceration surrounded with normal colonic mucosa, colitis with ulceration, and pseudomembrane formation (very rare). The gold standard for diagnosis remains histopathology and immunohistochemical staining for CMV is the best confirmation test.

**References**
A 45-year-old woman presented with chronic mucous bloody diarrhea, fever and weight loss. She had been previous healthy and no history of NSAIDs use. Physical examination revealed oral ulcers but no genital ulcer. Pathergy test was negative. Colonoscopy showed multiple discrete deep round ulcers with normal intervening mucosa from sigmoid to cecum (Figure 1-3). Pathological biopsy revealed moderate acute colitis, intact crypt architecture. There were numerous lymphocytes and large number of neutrophilic infiltration. No organism, granuloma nor intranuclear inclusion body seen in lamina propria.
Diagnosis:
Intestinal Behçet’s disease

Discussion:
Behçet’s disease, BD is an inflammatory disorder of unknown etiology, characterized by recurrent oral aphthous ulcers, genital ulcers, uveitis, and skin lesions. Pathophysiologic characteristics of BD are vascular injuries, hyperfunction of neutrophils, and autoimmune responses. Disease occurs along the ancient Silk Road with highest prevalence in Turkey. The onset is typically in the third or fourth decade of life. Involvement of the gastrointestinal tract, central nervous system, and large vessels is less frequent, although it can be life threatening. A prevalence of intestinal BD ranges widely by area from 3 to 16% of all patients with BD. The intestinal lesions of BD occur in two forms: mucosal inflammation and ischemia/infarction. Distinguishing intestinal BD from Crohn’s disease or intestinal tuberculosis is difficult, especially in patients with ileocolonic ulcerations, demonstrated by colonoscopic examinations. Lee SK, et al. found that deep round and irregular/geographic-shaped ulcers and focal distributions are suggestive of Behçet’s disease. While the longitudinal ulcers and segmental/diffuse lesions suggest Crohn’s disease. Diagnosis of Behçet’s disease in the validation set produced sensitivity, specificity, and negative and positive predictive values of 94.3%, 90%, 94.7%, and 89.2%, respectively. Histopathological finding showed vasculitis of the small veins and venules with inflammatory cells including lymphocytic infiltration.

References
Case 20

Kriangsak Charoensuk, M.D.
Satimai Aniwan, M.D.
Naruemon Wisedopas-Klaikeaw, M.D.
Rungsun Rerknimitr, M.D.

A 46-year-old woman presented with chronic mucous bloody diarrhea. She had been well until a month before, she had mucous bloody diarrhea without fever and weight loss. Colonoscopy found continuous granular and friable mucosa from lower rectum to descending colon (Figure 1-4). There was some edematous and mild erythema of the mucosal folds at transverse colon. Biopsy showed lymphocyte and plasma cells infiltration at lamina propria with focal cryptitis and crypt abscess compatible with ulcerative colitis.

Figure 1-2: Granular and friable mucosa at rectum, sigmoid and descending colon

Figure 3: Edematous and mild erythema of mucosa at transverse colon

Figure 4: Normal colonic mucosa at ascending colon
Diagnosis:

Ulcerative colitis; granular pattern

Discussion:

Ulcerative colitis (UC) is a chronic disease characterized by diffuse mucosal inflammation limited to the colon. It involves the rectum in about 95% of cases and may extend proximally in a symmetrical, circumferential, and uninterrupted pattern to involve parts or all of the large intestine$^1,2$. The diagnosis of UC is suspected on clinical grounds and supported by the appropriate findings on proctosigmoidoscopy or colonoscopy, biopsy, and by negative stool examination for infectious causes. Endoscopic finding in ulcerative colitis (UC) typically reveals the following: erythema, edema/loss of the usual fine vascular pattern, granularity of the mucosa, friability/spontaneous bleeding, pseudopolyps, erosions and ulcers$^3$. The granular appearance is manifested by changes in light reflection during colonoscopy. Instead of reflecting light in large patches, the granular mucosa reflects a multitude of small points of light, giving the appearance of “wet sandpaper”$^{2,3}$.

References

A 33-year-old man presented with bleeding per rectum. He was diagnosed with ulcerative colitis for 3 years. He was in remission with azathioprine. Two weeks earlier, he developed bleeding per rectum and tenesmus. Colonoscopy showed multiple inflammed pseudopolyps along colon (Figure 1-4). Biopsy did not reveal granuloma. Inclusion body and acid fast bacilli were negative.
**Diagnosis:**

**Ulcerative colitis with inflammatory pseudopolyps**

**Discussion:**

Ulcerative colitis, UC is characterized by recurrent episodes of inflammation limited to the mucosal layer of the colon. It almost invariably involves the rectum and may extend in a proximal and continuous involve other portions of the colon. There are different endoscopic findings in UC, included pseudopolyps. Pseudopolyps are not specific for UC but are more common in UC, occurring in approximately 20 percent of cases. They have varying in size and be associated with increased severity and more extensive involvement in UC.

**References**

Case 22

Kessarin Thanapirom, M.D.
Rapat Pittayanon, M.D.
Naruemon Wisedopas-Klaikeaw, M.D.
Linda Pantongrag-Brown, M.D.
Rungsun Rerknimitr, M.D.

A 55-year-old man presented with significant weight loss. Computed tomography of the abdomen showed a 5 cm heterogenous mass with mild enhancement at pelvic cavity near the right external iliac artery (Figure 1-2). Tumor resection was performed. Histological findings revealed neuroendocrine tumor. As a workup of primary tumor, he underwent colonoscopy. The endoscopic finding showed submucosal mass at lower rectum (Figure 3). Biopsy showed round cell tumor which exhibited nest and sheet pattern. The chromogranin and synaptophysin had been done and stained in the tumor cells (Figure 4).
Diagnosis:
Neuroendocrine tumor (NETs) of the rectum

Discussion:
Neuroendocrine tumors (NETs) of colon and rectum are derived from enterochromaffin cells of the gut, found throughout the intestinal tract within the crypts of Lieberkühn. The clinical presentation of NETs is non-specific, depending on the site of origin. Half of all rectal NETs were diagnosed incidentally during colonoscopy in patients without specific rectal symptoms. Symptomatic patients presented with lower gastrointestinal bleeding, pelvic/rectal discomfort and bowel habit change. The carcinoid syndrome was rarely seen with rectal NETs. The endoscopic appearance of rectal NETs is a nodule with yellowish color; multiple nodular lesions are rare. Risk of metastasis and prognosis of rectal NETs are associated with tumor size, muscular and lymphovascular invasion, of which endoscopic ultrasound (EUS) is the best modality to assess. Resection is the main treatment of rectal NETs. Endoscopic resection has the role for small nodule less than 10 millimeters in diameter. Various endoscopic resection including endoscopic submucosa dissection (ESD), endoscopic mucosal resection (EMR) have been reported; however the best approach is still debated.

References