Case Study E: Colon Cancer

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Disease Process and Pathophysiology
Abstract

There are 11 body systems that help us function correctly and productively. One of the most important one is the digestive system. This system breaks down foods into the nutrients we need. If any of the organs in this system is compromised than we will be losing a very important nutrients. The large intestine or colon is made up of the cecum (here is where the appendix is found), ascending colon, transverse colon, descending colon, sigmoid colon, and rectum ending in the anus which is an exterior opening of the body. The function of the colon are the follow:

1. Absorbing water
2. Absorption of vitamins
3. Reducing acidity and protecting from infections
4. Producing antibodies: appendix

Absorption of vitamins are K, B1, and B2, B6, B12 and biotin; it is done by the help of 700 species of commensal bacteria found in the large intestine. This bacteria is natural found here and considered friendly. Fiber is also broken here. Bacterial fermentation leads to flatus, which it is made up of nitrogen and carbon dioxide. Bicarbonate is also secreted in the mucosa of the large intestine in order to neutralize acid produced by the bacteria. The mucosa also aids in the protection against infection by working as a barrier (Dr. Ananya Mandal, 2016).

Cancer or any disorders can affect any organ in the digestive system. According to the National Cancer Institute, “Colorectal cancer is the third most common non-skin cancer in both men and women. It is the second leading cause of cancer-related mortality in the United States. Over the past decade, colorectal cancer incidence and mortality rates have decreased in
all racial/ethnic populations except American Indians/Alaska Natives. Men and women have similar incidence rates through age 39; at and above age 40, rates are higher in men” (National Cancer Institute, 2014). Colorectal cancer is cancer of the colon and rectum. There are many causes or risk factors of colon cancer. The first risk is genetics. There might be a mutated gene that is not functioning right in the large intestine. Also if you have family history with colon cancer, that puts you in a higher risk. Family history of polyps and if this is the case than you should be getting screen more often. Second, if you are over the age of 50. Third inherited conditions, for example, Lynch Syndrome or HNPCC (Hereditary nonpolyposis colorectal cancer). Fourth, cigarette smoking and alcohol consumption. Fifth, diet and lifestyle. According to Peter Crosta M.A. “Studies suggest that diets high in red meat and fat (especially animal fat) and low in calcium, folate and fiber may increase risk of colon cancer. Also, some studies suggest people who eat a diet very low in fruits and vegetables may have a higher risk of colon cancer” (M.A., 2015). Sedentary life style also increase your chances of developing colon cancer. Sixth, history of Crohn’s disease and ulcerative colitis. Seventh, polyps that are precancerous that are found in the intestine. There are three common ones and they are adenomas (these can be removed during a colonoscopy procedure), hyperplastic polyps and inflammatory polyps. There are many treatments available and prognosis is great when caught in time.
Case Study E: Colon Cancer

Mrs. R.C is an 82-year-old female who has been complaining of the following:

1. abdominal discomfort
2. fatigue
3. loss of energy
4. pain
5. indigestion
6. occasional vomiting
7. cannot eat large meals
8. weight loss: 30 pounds

She has been diagnosed with colon cancer, especially in the descending colon. She has a history of uterine cancer and hysterectomy was preformed 12 years. Radiation was a success but a tumor was found between bladder and vagina after 2 years of the uterine cancer. She had colostomy was created. She had some complications and the tumor had spread to other parts of the intestine. The doctors performed another surgery and due to a decline of health she did not survived the surgery. Colon Cancer can be diagnosed there a routine physical examine or through symptoms. The symptoms to look for are:

1. Diarrhea or constipation
2. Changes in the consistency of stool: narrow stool than usual
3. Blood in stool: bright red or very dark
4. Rectal bleeding
5. Pains, cramps, or gas, bloating, fullness
6. Pain during bowel movements
7. Continual urges to defecate
8. Weakness or fatigue
9. Weight loss for no reason
10. IBS: Irritable bowel syndrome
11. Anemia
12. Vomiting
13. Being tall (5 feet 8 inches or taller for women; 5 feet 11 inches or taller for men) (, 2015-2016)

Many people may or may not experience any symptoms and it also depends on the location of the colon. There are 8 ways to diagnosed colon cancer that the physician may use. Like any other doctor visit your first exam will be a physical exam and history. The more information you give the easier it is for the doctor to reach a conclusion. A digital rectal exam may be preform. Here either the nurse or physician insert a finger into the rectum to feel for any lumps or abnormalities. The physician may order a fecal occult blood test. Here you will collect some stool samples and placed it on cards that are either sent directly to the doctor or a laboratory. Another procedure used to diagnose colon cancer is a lower GI series or Barium enema, which basically are x-rays. “A liquid that contains barium (a silver-white metallic compound) is put into the rectum. The barium coats the lower gastrointestinal tract and x-rays are taken” (National Cancer Instiute, 2014). The doctor may want to look at sigmoid and rectum and order a sigmoidoscopy. The purpose of this procedure is to look for polyps and abnormalities. A device with a lens is inserted through rectum until it reached the sigmoid colon. If any polyps are
found, they will be removed and studied afterwards. With the colonoscopy the whole large intestine is observed. The instrument or device is inserted through the rectum. After any material is removed from the colon a biopsy is done. The differential diagnoses for colon cancer are Crohn disease, small intestinal diverticulosis and ulcerative colitis.

The prognosis of this disease is great as long it is caught on time and on the first stage. There are five stages of colon cancer and treatment is based on the stage that patients are found on. The stages are:

1. Stage 0 or the carcinoma in situ: Here the abnormal cells are only found in the innermost layer of the colon which is the mucosa.
2. Stage 1: Colon Cancer: The cancer is not only in the mucosa layer but has spread to the muscle layer too.
3. Stage 2: this stage is divided into three sub stages:
   - Stage 2A: cancer has spread from muscle to the serosa layer.
   - Stage 2B: cancer spread from serosa layer only and has not reached any other organ nearby.
   - Stage 2C: cancer has reach nearby organs
4. Stage 3: also divided into 3 sub stages
   - Stage 3A: mucosa to submucosa to muscle layer and to at least 3 lymph nodes or tissue near the node. Also mucosa to submucosa and a minimum of 4 and maximum of 6 lymph nodes.
5. Stage 3B: muscle to serosa and has not affected any organ yet but spread to at least 7 nodes.

- Stage 3C: spread to at least 7 nodes and to a nearby organ.

5. Stage 4: most dangerous and has 2 sub stages

- Stage 4A: spread to the following organs liver, lungs, ovary
- Stage 4B: spread to an organ not near the colon or lining of the abdominal wall.

Many patients are going through clinical trials for treatment of colon cancer. Right now there are 6 standards treatments patients may use. The treatments are surgery, radiofrequency ablation, cryosurgery, chemotherapy, radiation therapy, and targeted therapy. The first treatment and most common one used in any stage is surgery. It is done in two ways. In the local excision a polypectomy is performed, which the polyp is removed. The patient doesn’t have to worry about a scar because the abdominal wall is not being cut open. Procedure is done through a device being inserted into the rectum. With the resection of the colon with anastomosis the patient is being cut open and a part of the colon is removed, which is known as a colectomy. The two health parts are sew together (anastomosis). At this point the doctor will also remove nearby lymph nodes. A colostomy may also be performed. Here the doctor will have to create an opening outside the body called a stoma if the two health parts of the colon are not able to be sew together (National Cancer Institute, 2014). At the end a bag will be placed in order to collect the waste from the intestine. This stoma can be temporary or permanent depending on the extend.
damage of the colon. Second treatment done is radiofrequency ablation which a special probe with tiny electrodes are used to kill the cancer cells. Here the patient is under either general or local anesthesia. Third treatment is cryosurgery. In cryosurgery, the cancerous tissue is destroyed by being frozen. Fourth treatment used is chemotherapy. Cancer cells are destroyed or kept from multiplying by using drugs. The drugs be can be taken orally or injected. Fifth treatment that may be used to treat colon cancer is radiation. Here the patient is getting high levels of x-rays to kill the cancer. The last treatment is targeted therapy. In this therapy a specific cancer cell is attacked only with a drug and the normal cells will not be harmed. There are two targeted therapies used to treat colon cancer, they are monoclonal antibodies and angiogenesis inhibitors. “Monoclonal antibodies are made in the laboratory from a single type of immune system cell. These antibodies can identify substances on cancer cells or normal substances that may help cancer cells grow. The antibodies attach to the substances and kill the cancer cells, block their growth, or keep them from spreading. Monoclonal antibodies are given by infusion. They may be used alone or to carry drugs, toxins, or radioactive material directly to cancer cells” (National Cancer Institute, 2014). Angiogenesis inhibitors target the blood vessel directly that supplies the tumors and it stops the growth.

The prevention of the disease may doctor may want their patients to follow are regular screening especially after the age of 50. The American Cancer Society recommends the following screening test to be done, fecal occult blood test annually, stool DNA testing, flexible sigmoidoscopy every 5 years, colonoscopy every 10 years and CT colonography every 5 years. Also the intake of the aspirin, NSAID: ibuprofen and naproxen, and COX-2 inhibitors: Celebrex
may reduce the risk (M.A., 2015). Living a healthy life is a great way to prevent the disease by watching your weight, exercising more, more water intake and a diet of mostly fruits, vegetables and whole grain and limiting saturated fats and red meat. Also limit the consumption of alcohol intake and quite smoking. Increase vitamin intake especially calcium and vitamin D may reduce your risk of cancer. The ideal amount is 1,000 to 1,200 mg per day of calcium and 1,000 IU per day of vitamin D. Also make sure your multivitamins have Folate. New treatment is normally done through clinical trials. According to the journal on Daily science “A groundbreaking experimental therapy has been discovered that has the ability to suppress the development of ulcerative colitis (UC), a disease which causes inflammation in the digestive tract and colon cancer. The treatment utilizes a chemical inhibitor able to block an RNA molecule (microRNA-214) involved in the transmission of genetic information” (2016). Another discover was made in treating not just colon cancer but also colitis. Scientists are studying certain sugars that have an important role in the development of both disease. According to the journal on Daily Science by the scientist the importance of the findings are "First, these findings tell us that this mucus made up of O-glycan sugars is essential for preventing the development of colitis and colon cancer," said Xia, who holds the Merrick Foundation Chair in Biomedical Research at OMRF. "When we deleted the sugar, colitis developed. That makes it essential in prevention." Second, said Xia, he and his team now have created an effective model to help researchers understand colorectal disease and to develop and test therapies” (May 2016). Basically new therapy for colon cancer will be based on repairing the sugar O-glycan and the actually mucosa layer.
With the new promising research scientist are making the prognosis of patient will be increasing. They will have a better life quality. Who knows in the near future this cancer may be eliminated completely if all the risk factors are dealt with on time.
### Stool Chart

#### Healthy Stools
- **Description:** Looks like a smooth soft sausage, or is sausage-shaped with cracks in the surface.
- **Action:** Great news! Your stool is completely healthy. Continue to monitor your stools for changes that could have health implications. Continue to eat plenty of fibre to reduce your chances of developing bowel cancer.

#### Change in Bowel Habit
- **Description:** A mushy stool entirely liquid.
- **Action:** A change in bowel habit lasting for 3 weeks or more, especially to looser or runny stools, could be a sign of bowel cancer. Consult your doctor.

#### Blood in Stools
- **Description:** More than a few drops of bright blood, stool contains darker red blood and can appear black like tar.
- **Action:** Most often, if blood is bright, fresh blood, the bleeding is caused by an anal tear or piles. Blood from higher up in the bowel goes dark red or black and can make your stools look like tar. This type of bleeding can be a sign of bowel cancer. Consult your doctor immediately.

If stools appear ribbon like consistently consult a doctor immediately.
References


