Colorectal cancer (CRC)

Epidemiology

Colorectal cancer (CRC) is the fourth most common cancer worldwide and the second leading cause of cancer related death in America. It is a condition that commonly affects older patients, over 65 years, but the incidence in younger patients is increasing. While in the past it was thought to be a disease that mainly affected Caucasian patients internationally, locally, the incidence in all other races has been noted to be increasing especially in black patients. Rectal cancer is more common in male than female patients. The increase in younger patients is thought to be due to inherited CRC.

Risk factors

Risk factors that influence the development of CRC include older age (>65 years of age), smoking, obesity, diet that is high in red meat, processed meats, heavy use of alcohol, history of inflammatory bowel disease (IBD), personal history of colorectal cancer, colorectal polyps or a hereditary CRC syndrome e.g. lynch syndrome (hereditary non-polyposis colorectal cancer HNPCC).

Screening and modalities used

Diagnostic tests are used once a patient presents with symptoms but screening is the application of various noninvasive tests used to look for a disease when a person doesn't any symptoms. CRC screening modalities include use of faecal occult blood tests, sigmoidoscopy, colonoscopy etc.

Colorectal cancer almost always develops from *precancerous polyps* in the colon or rectum these can be removed before they turn into cancer. Screening tests can also find colorectal cancer early, when treatment works best.

Locally South Africa has no national CRC screening programme like in breast Cancer (mammogram MMG) and cervical cancer (Pap smear). In the UK, all members of the public are screened for CRC at the age of 55yrs using a faecal occult blood test. If positive, they are sent for Colonoscopy.

Clinical presentation of CRC

Patients with colorectal cancer (CRC) may present in three ways:

1. Suspicious symptoms and/or signs
    - Significant weight loss
    - Constipation
    - Change in bowel habits (constipation due to partial obstruction then overflow diarrhea)
    - Per rectal bleeding
    - Rectal mass
    - Tenesmus and rectal pain

2. Asymptomatic individuals discovered by routine screening
   e.g. Positive FOBT leading to colonoscopy that picks up the early CRC cancer.

3. Emergency admission with complications of the CRC e.g.
    - intestinal obstruction
    - obstructive symptoms, including colicky pain.,
    - perforation and peritonitis,
    - Rarely, an acute gastrointestinal bleed
    - Abdominal pain
    - Unexplained iron deficiency anemia

4.Symptoms of the metastatic disease

CRC can spread by lymphatic and hematogenous dissemination, as well as by contiguous and transperitoneal routes. The most common metastatic sites are the regional lymph nodes, liver, lungs, and peritoneum. Patients may present with signs or symptoms referable to any of these areas. The presence of right upper quadrant pain, abdominal distention, early satiety, supraclavicular adenopathy, or periumbilical nodules usually signals advanced, often metastatic disease.

Because the venous drainage of the intestinal tract is via the portal system, the first site of hematogenous dissemination is usually the liver, followed by the lungs, bone, and many other sites, including the brain. However, tumors arising in the distal rectum may metastasize initially to the lungs because the inferior rectal vein drains into the inferior vena cava rather than into the portal venous system.

5. Unusual presentations — There are a variety of atypical presentations of CRC. These include the following:

- Local invasion or a contained perforation causing malignant fistula formation into adjacent organs, such as bladder (resulting in pneumaturia) or small bowel. This is most common with caecal or sigmoid carcinomas; in the latter case, the condition can mimic diverticulitis.

- Fever of unknown origin, intraabdominal, retroperitoneal, abdominal wall or intrahepatic abscesses due to a localized perforated colon cancer

- CRC may be detected on the basis of discovery of liver metastases that are detected incidentally during studies such as gallbladder or renal ultrasound, or CT scans for evaluation of other symptoms (e.g. dyspnea).

Staging of CRC

Currently, the staging system most often used for colorectal cancer is the American Joint Committee on Cancer (AJCC) TNM system, which is based on 3 key pieces of information:

- The extent (size) of the tumor (T): How far has the cancer grown into the wall of the colon or rectum?
- The spread to nearby lymph nodes (N): Has the cancer spread to nearby lymph nodes?
- The spread (metastasis) to distant sites (M): Has the cancer spread to distant lymph nodes or distant organs such as the liver or lungs?

All CRC patients require a completion colonoscopy to exclude synchronous lesions, chest-abdominal-pelvic CT scan, and rectal cancer patients will also require a pelvic MRI.

Investigations

1. Blood tests
    i. FBC look at Hb, MCV, platelets in patient with anemia or history of PR bleeding
    ii. U&E: patients presenting with bowel obstruction may have electrolyte imbalances. Further staging via CT scan requires administration of contrast so a normal U&E is necessary.
    iii. LFT: not for diagnosis of liver metastasis like in breast cancer, in CRC, a normal LFT is necessary for the administration of chemotherapy
    iv. CEA is a tumor marker not used for diagnosis of CRC but rather for monitoring during treatment and surveillance
    v. HIV test: in our set up, cancer is an AIDS defining condition meaning that regardless of the CD4 count, once diagnosed with CRC & HIV the patient needs to start ARVs while work up is ongoing to ensure that they will be fit enough for chemotherapy is necessary.

2. Imaging
    i. CXR: rule out obvious multiple cannon ball lung metastasis that might preclude other tests being necessary
    ii. AXR: rule out features of partial bowel obstruction on clinical history and AXR as the patient will need bowel preparation prior to colonoscopy. Ensure that you don't tip a patient with partial bowel obstruction over into complete bowel obstruction after they receive the 4L of bowel preparation over 24hrs and becomes an emergency surgical case due to the malignant large bowel obstruction.

3. Colonoscopy
    i. To identify the site of the tumor e.g. caecum, sigmoid, rectum etc., and biopsy it
    ii. To biopsy the tumor for histological diagnosis
    iii. To remove other premalignant lesions e.g. polyps
    iv. To identify impending or partial bowel obstruction e.g. a tumor that doesn't allow progression of the scope through. NB: colonoscope diameter is 9.8 – 12.8mm
    v. For palliation of impending bowel obstruction using a colonic stent

Complications of colonoscopy e.g. perforation, bleeding, electrolyte imbalances due to the fluid losses at the time of bowel preparation and complications of the sedation given must be discussed with the patient prior to the procedure and informed consent obtained.

4. Double contrast barium enema DCBE
   DCBE was previously used to show an apple core lesion suggestive of a

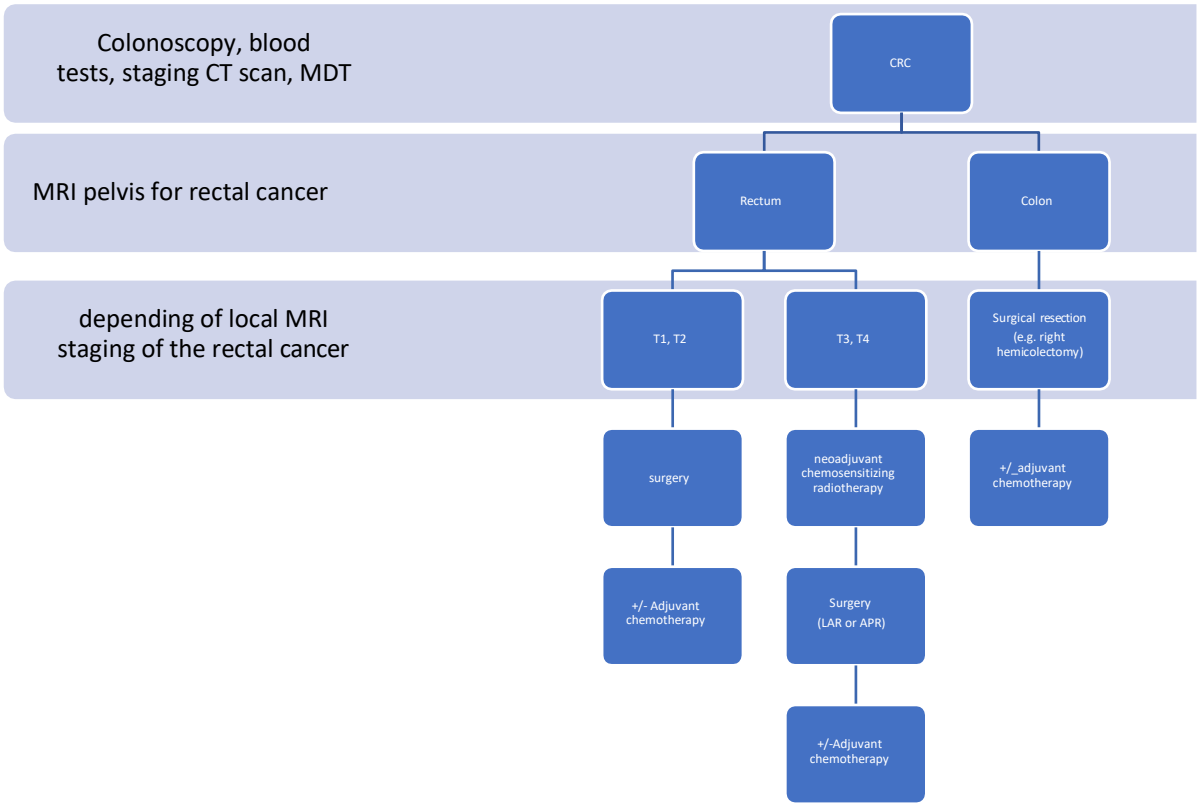
CRC. There after the patient would still have to undergo colonoscopy for biopsy of the lesion. It is no longer used nowadays due to the presence of CT scan with contrast and colonoscopy.
DCBE can also cause complications such as complete obstruction due to the thick barium forming concretions with time. The barium precludes endoscopy (colonoscopy or sigmoidoscopy) by coating the tip of the scope and obscuring view. It isn't easily washed away.

5. Staging CT scan of the chest abdomen and pelvis to check for metastasis
6. MRI pelvis for local (T & N) staging of rectal cancers. Colon cancers do not require an MRI scan.

Principals of Management of CRC

1. Must always be in a multidisciplinary team (MDT) setting.
2. Determine if the aim will be curative or palliative treatment. This decision is made based on the TNM stage, the tumor operability and the patient's fitness for theatre.
3. Treatment options
    i. Medical oncology (chemotherapy)
    ii. Radiation oncology (radiotherapy)
    iii. Surgical

Management algorithm for CRC without metastasis



For patients with CRC metastasis, a different treatment algorithm is used. They may either have chemotherapy first the surgery for the liver metastasis then more chemotherapy or radiotherapy before resection of the cancer primary. Different algorithms are used for different patients. This decision is usually determined in the MDT.

Indication for adjuvant chemotherapy

1. Metastatic CRC
2. >T3, T4 tumours
3. Positive lymph nodes (a minimum of 14 nodes in the resection specimen need to be examined for tumor deposits)
4. High risk features e.g. lymphovascular infiltration, perineural infiltration etc.

Palliation in CRC

1. Pain: analgesia as per the WHO pain ladder. Ultimately most patients end up on morphine syrup. Remember to give a laxative too as the opioid may cause constipation as a side effect.
2. Bowel obstruction: colonic stent or diverting loop colostomy or surgery to resect the tumor or bypass the tumor.
3. Obstructive jaundice due to enlarged lymph nodes at the porta hepatis: ERCP and stent or PTC
4. Psychological distress: psychology consultation
5. Faecal incontinence secondary to low rectal cancers involving the sphincters
6. Pain in rectal cancers: radiotherapy
7. Metastatic cancer: chemotherapy to slow down tumor progression and prolong life.
8. Occasionally, nothing can be done in very unfit patients with very advanced disease presenting in extremis. In this case we discuss with the patient and his family and only give analgesia and supportive care.

Follow-up/ Surveillance

Surveillance is the use of various modalities used to assess a patient who had CRC treated with curative intent to ensure that the cancer doesn't recur. Surveillance is carried out for a minimum of 5 years. Modalities involved include:

1. Clinical examination
2. Blood tumor marker CEA level and trend
3. CT scan
4. Colonoscopy
5. PET scan if CEA is increasing yet CT scan and colonoscopy are negative