

INTRODUCTION

Colorectal cancer is listed as the 3rd commonest cancer in the developed world, but more importantly it is acknowledged as the 2nd commonest cause of cancer related deaths. In South Africa, the prevalence of colorectal cancer is relatively low in African patients, but is notably on the increase. There is a need to increase awareness and improve outcomes in our management of this preventable disease.

PATHOGENESIS

All cancers are thought to arise from pre-existing colonic adenomas, the 'adenoma-carcinoma sequence'. The sequence describes the sequence of changes from normal mucosa to hyper-proliferative mucosa to adenoma and eventually to carcinoma. It is for this reason that colon cancer is considered to be a potentially preventable disease. By addressing the tumour while it is still a polyp, one can eliminate the risk for cancer (in that particular polyp). It is vitally important to note that removal of a particular polyp does not eliminate the risk for the patient to develop further adenomas, and hence future carcinomas elsewhere in the colon.

The incidence of adenomatous polyps in the general population is reportedly as high as 20% in post mortem studies. This is far greater than the average incidence of colorectal cancer in the same general population of 5%, hence it is clear that not all polyps develop into malignancies, many regress spontaneously.

Polyps that are considered high risk include:

- Large polyps > 1cm
- Villous lesions
- Sessile lesions
- High grade dysplasia

Polyps can occur anywhere on the colon, however they are most commonly found within in the recto-sigmoid region.

It is unclear of the exact initiating event for the development of colonic adenomas, but certain genetic factors have been identified especially in the patients with a genetic predisposition for colorectal polyps and carcinoma. Vogelstein highlighted a sequence of events that led to the development of colorectal carcinoma in patients with polyposis. There are a series of mutations that have been identified

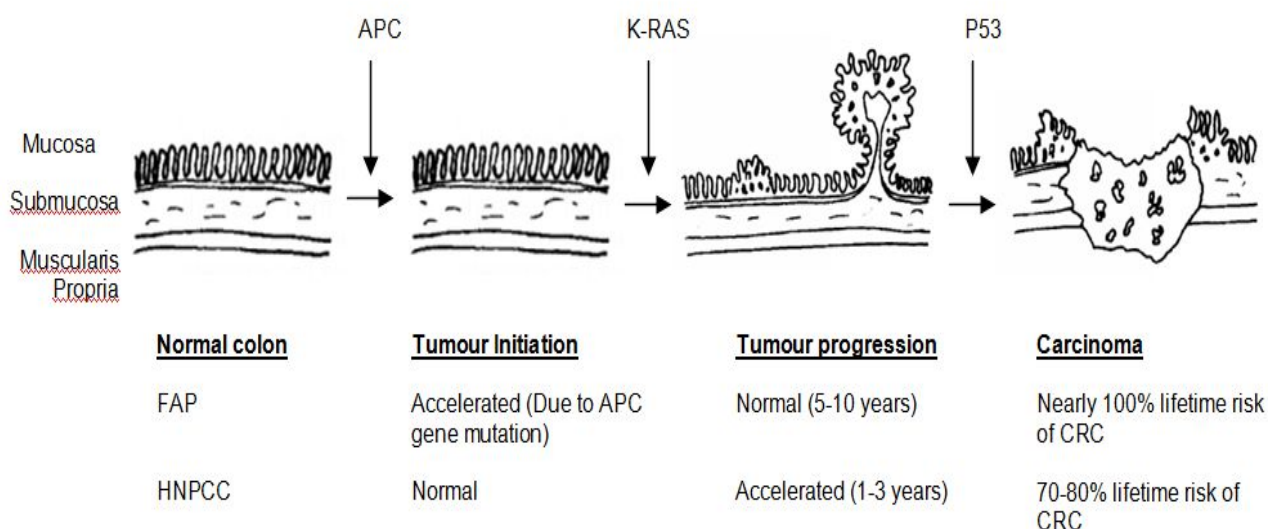


Fig 1 Adenoma-carcinoma sequence

that predisposed to polyp formation and eventually to the development of colorectal carcinoma. The sequence of these mutations may vary for the various hereditary or sporadic pathways, but certain mutations have been consistently identified within these pathways.

EPIDEMIOLOGY AND AETIOLOGY

Colorectal cancer does demonstrate an increased incidence amongst certain populations, which thereby supports the genetic component of the disease. What is more intriguing is that this inherent risk is often altered when populations migrate from one region to another highlighting the environmental contribution to this disease. Japanese and Puerto Ricans residing in the United States have a higher incidence of colorectal cancer when compared to individuals from their native countries. It is clearly evident that the aetiology of colorectal cancer is multifactorial and this best explains why majority (up to 80%) of cases reported are sporadic, with no obvious pre-existing genetic predilection.

Dietary Parameters

These are regarded as one of most manageable and/or controllable risk factors.

Diets comprising high amounts of animal fat and meat are associated with an increased risk for colorectal cancer. High intake of vegetable fats however, does not confer similar risks. Substitution with fish and poultry is thought to reduce risk by virtue of reducing the percentage of animal fat consumed.

High intake of dietary fiber has been associated with a reduction in the risk of colorectal cancer. The protective mechanism is thought to be effected by a reduction in intestinal transit time thereby reducing the exposure of colonic mucosa to intraluminal toxins. It is also postulated that fiber may alter the luminal environment as well. The maximum benefit is from wheat bran

and cellulose. Supplemental fiber is not thought to be as beneficial.

Physical Parameters

Obesity has been associated with an increased risk of colorectal cancer. This factor has been shown to be independent of the risks conferred by high intake of animal fats. Obesity is associated with relative insulin resistance resulting in higher levels of circulating insulin. Insulin together with insulin growth factor has been demonstrated to increase the risk of adenoma formation. This risk is more evident in women further alluding to a possible hormonal mechanism as well. Increased energy expenditure in the form of exercise is thought to be protective against colorectal cancer. Individuals with higher energy expenditure have demonstrated a lower incidence of colorectal cancer

Hereditary cancer (familial risks)

- **Familial Adenomatous Polyposis (FAP)** is an autosomal dominant condition characterised by the presence of 100's of adenomatous polyps within the colon. The genetic defect has been identified on chromosome 5 (the APC gene) which is also known as the tumour suppressor gene. Risk of developing colorectal cancer is 100%. Most patients manifest with polyps during their teenage years and onset of cancer is usually in the 4th decade. Identification of the actual genetic defect facilitates determining whether family members are affected or not. Affected family members should be subjected to intense surveillance and timeous surgery. Gardner's syndrome refers to the patients afflicted by colonic polyposis together with extra-intestinal manifestations, and Turcot's syndrome refers to patients who

present with polyposis in combination with a brain tumour.

- **Attenuated FAP** is considered a less aggressive variant of FAP. Although autosomal dominant, patients present with fewer adenomas (<100) with later onset of disease. The risk of colorectal cancer is also reduced. Most patients present with polyps in the 4th to 5th decade. Cancer is usually diagnosed after the 6th decade.
- **Lynch syndrome** (also known as Hereditary Non-Polyposis Colorectal Cancer) is another autosomal dominant disease associated with colorectal cancer as well as extra-colonic malignancies. The syndrome occurs as a result of germline mutations in the mismatch repair genes. The lifetime risk of colorectal cancer is up to 80%. The Amsterdam criteria are used to help identify individuals at risk.
- **MUYTH Associated Polyposis (MAP)** is an autosomal recessive condition. It is associated with mutations in the MUYTH gene. Presentation is similar to attenuated FAP.

Inflammatory bowel disease

The risk of colon cancer in patients with colitis is time dependent. It was previously thought the patients with ulcerative colitis are at greater risk of patients with crohn's colitis, but this is no longer considered valid. The risk of colon cancer progressively increases with the duration of disease, where the risk of cancer after 20yrs duration is less 5%, and this increases to about 10% at 20yrs.

Other factors thought to increase the cancer risk include:

- Greater extent of disease
- Evidence of mucosal dysplasia

- Sclerosing cholangitis
- Family history of cancer

Patients with early onset and greater extent of disease have the greatest risk of developing colorectal cancer during the course of the disease.

SCREENING

Screening refers to the investigation of patients at potential risk of colon cancer. Owing to the low incidence of colorectal cancer in South Africa, screening of the general population is not feasible, it is too costly, and too demanding on the limited resources we have at hand.

Screening is reserved for patients identified to be at higher risk of colon cancer by virtue of family history or symptoms suggestive of large bowel pathology.

Testing for faecal occult blood is a cheap relatively cost-effective means of identifying those patients at higher risk. Whilst the test is sensitive for the determination of the presence of occult blood in stool; it is not very specific with regards to establishing the diagnosis of colorectal cancer.

The presence of blood in the stool warrants a colonoscopy.

First degree relatives of cancer patients should undergo a colonoscopy 10 years prior to the age of onset of disease in the affected relative.

Screening flexible sigmoidoscopy and colonoscopy are not considered feasible for the general population, but has been successfully utilised in screening of identified populations at high risk of colorectal cancer.

SYMPTOMS AND SIGNS

Presenting symptoms and vary significantly depending on the site of the pathology and extent of disease. Rectosigmoid tumours account for nearly 50-60% of all colorectal cancers. Right-sided cancers occur in up to 20% of cases.

Patients with rectal tumour have a tendency to present somewhat earlier. The symptoms include a bloody or mucoid discharge from the anus, alteration in bowel habit with/out tenesmus. Where the presentation has been delayed, there may be features of obstructive symptoms and significant perianal pain due to involvement of the pressure symptoms from a large pelvic mass. A discrete mass is usually palpable on digital rectal exam.

Left-sided colonic tumours tend to present with alteration in bowel habits, with patients complaining of intermittent constipation or diarrhoea or both. The obstructive symptoms are attributed to the narrower calibre of the left colon. Passage of blood per rectum may also be reported. Marked weight loss is considered a poor prognostic indicator. In delayed presentations, patients may report the presence of a palpable mass or symptoms and signs of large bowel obstruction.

Right-sided colonic tumours have the least distinct presentation. Patients are often referred for investigation of unexplained anaemia and/or weight loss. Occult faecal blood is often detected in these patients. In more advanced disease, an abdominal mass may be evident. Obstructive symptoms are uncommon in patients with right-sided cancers owing to the larger calibre of the lumen on the right colon and liquid nature of its content. Pain is relatively non-specific in all of these patients.

DIAGNOSIS

The diagnosis of colorectal cancer can only be made on histological assessment. This requires that a sample of tissue be obtained for assessment, and this requires an invasive assessment of the colonic mucosa.

Procto-sigmoidoscopy would be sufficient to confirm the diagnosis of a distal colonic lesion histologically. Unfortunately, there is little more information that can be attained. One is only aware of the level of the tumour and whether or not it occupies part or all of the lumen.

Colonoscopy remains the gold-standard test for diagnosing colorectal carcinoma. It entails a direct inspection of the colonic lumen from the anus all the way up to the caecum (and sometimes including the terminal ileum. Once a lesion is identified, a sample may be obtained for histological assessment to confirm the diagnosis. The rest of colon is then thoroughly assessed and evaluated to exclude any synchronous lesions. It is imperative to rule out other synchronous lesions within the colon as this would be taken into consideration when determining the appropriate extent of resection.

Barium enemas can still be used in the investigation of colon cancer. Whilst they are able to characterise the tumour somewhat and rule out synchronous lesions, a biopsy is still required to verify the diagnosis.

STAGING

In order to accurately stage a patient with colorectal cancer, it is important to determine the local extent of the disease as well the presence of metastatic disease. Radiological investigations are of greatest benefit.

Chest X-rays are a simple means of assessing and ruling out obvious lung involvement. Features of lung metastases include opacities within the lung field, veiled appearance of the lung or a pleural effusion.

Ultrasound of the abdomen is essential for the assessment of metastatic disease. The liver is the most frequently involved organ in

metastatic disease. This is because all venous blood from the gut drains into the portal circulation which feeds directly into the liver. Liver metastases appear as hypo-densities within the liver. Other features of advanced disease include ascites and lymphadenopathy. The added benefit of ultrasound is that it may aid in the sampling of lesions not clinically evident.

Both of these cost-effective, non-invasive are tests aimed at the identification of patients with advanced metastatic disease. Further, enhanced imaging is still required to ascertain the true nature of any identified lesions together with invasive tissue sampling to confirm the diagnosis.

CT scan (Computed Tomography) remains the gold standard investigation for the staging of colorectal cancers. It is an accurate and rapid imaging modality. CT can assess for the evidence of local and metastatic spread by imaging the chest abdomen and pelvis

Local features:

- Size and location of primary and depth of invasion
- Involvement of any adjacent organs or structures
- Presence of any surrounding lymph nodes

Metastatic features:

- Opacities in liver, lung or bone
- Ascites
- Pleural effusion

Using CT scan, one is able to identify the stage of disease at presentation, and thereby determine the optimum treatment strategy.

MRI scans (Magnetic Resonance Imaging) are not routinely used in the assessment of colon cancer. They are reserved for the assessment of rectal cancers, as MRI provides superior image quality for pelvic lesions. It is also more accurate in determining depth of invasion and local extent of

rectal tumours. This is critical in determining the best management strategy for the patient.

PET scanning (Positron Emission Tomography) is another useful imaging tool used to assess patients where an element of diagnostic doubt exists. In situations where CT is suggestive of metastases but inconclusive, PET scans can be utilised. It is an isotope-based study, where the isotope is rapidly taken up by the tumour cells thereby highlighting their location throughout the body. This is a very expensive imaging tool and not readily available. It also facilitates the differentiation of scar tissue from recurrent cancer tissue at the site of previous surgery.

MANAGEMENT

The management of colorectal cancer is best conducted within the realm of a multi-disciplinary team. This way one ensures that all the relevant options are considered and decisions are always made in the best interests of the patient, without bias towards a particular therapeutic option. The cornerstones of a multi-disciplinary team include surgeons, oncologists, stomatherapists and radiologists.

The management of a newly diagnosed patient is based on two pivotal factors, the patient's fitness to tolerate surgery (and/or oncological therapy) and the extent of tumour involvement (refer diagram) A patient's fitness is determined by assessing their ability to withstand the physiological strain of the proposed treatment. This way we ensure that the patient is not subjected to a therapy that they are unlikely to tolerate. Often this requires a thorough pre-anaesthetic work up and assessment. An unfit patient should be spared the indignity of having to endure a major operation with little chance of survival, it is best that they be referred for best palliative therapy only.

Once a patient has been deemed fit for surgery, one has to turn their attention towards the characteristics of the tumour.

Resectability is evaluated using the appropriate staging investigations. A number of factors are considered to determine respectability

A locally advanced colonic tumour may still be considered resectable provided that the tumour together with the adjacent structure it is involving can be resected en bloc (eg. Stomach, small bowel segment, spleen), thereby ensuring that all tumour involved tissue is removed. A locally advanced rectal tumour however is irresectable as one cannot resect the pelvic side-wall together with the specimen.

Metastatic disease equates to incurable cancer as it is impossible to remove all of the tumour involved tissue. These patients are best managed by oncology, using chemotherapy and/or radiotherapy, with surgery being reserved for emergency situations (eg. impending or established obstruction, perforation).

A tumour that is deemed irresectable should not be considered for surgery. For those lesions that are locally advanced and not amenable to curative resection, neoadjuvant chemotherapy and/or radiotherapy can be considered to help downstage (or downsize) the tumour rendering it resectable. This has been most successfully demonstrated in locally advanced rectal cancer where pre-operative downstaging has demonstrated superior outcome when compared with surgery alone.

Once a tumour has been assessed as being resectable, it is imperative that the patient be extensively counselled regarding the nature of the proposed surgery, the relevant complications and all of the possible outcomes. The issue of a possible stoma should be thoroughly addressed (especially for

patients with left-sided disease) and is best done in conjunction with a stomatherapist.

After successful completion of surgery and recovery, the histology of the resected specimen has to be reviewed, and the risk of advanced disease and/or spread has to be ascertained. A number of factors need to be assessed

Completeness of surgical excision	Are the surgical margins involved?
Adequateness of resection	Is there sufficient lymph node yield?
Features of advanced disease/spread	Are there lymph node metastases? Are there peritoneal deposits/metastases?

In those instances where the tumour has been completely excised with adequate lymph node yield and no features of advanced disease, the patient can be considered cured.

Failure to ensure adequate clearance with appropriate lymph node yield constitutes an inadequate resection and warrants further (adjuvant) chemotherapy and/or radiotherapy. Any evidence of advanced disease (lymph node or peritoneal metastases) warrants referral to oncology for further adjuvant therapy.

Palliative therapy is reserved for those patients who are either too frail to undergo surgery; have surgically irresectable disease on staging

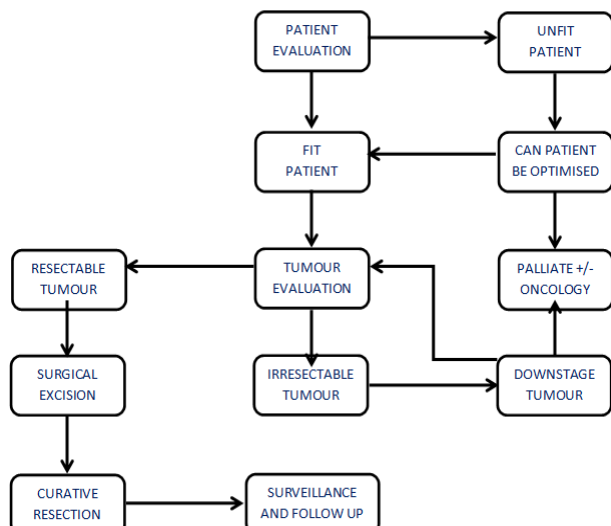
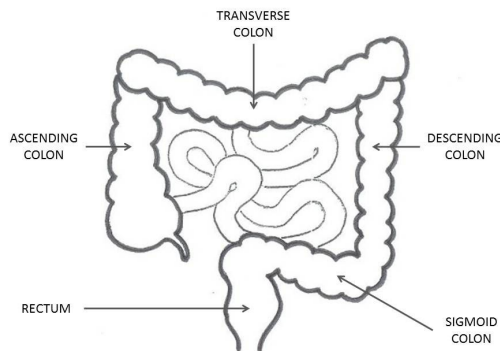


Fig 2 Management algorithm for Colorectal Cancer

examinations or recurrent disease following prior surgery. Palliation can be subdivided into various therapeutic options depending on the presentation.

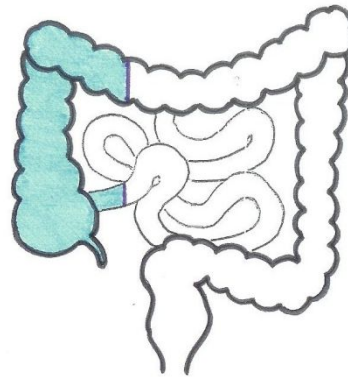
SURGICAL MANAGEMENT

Surgery plays a vital role in the management of colorectal malignancy. It is not solely reserved for the purpose of cure, but also has an important role in palliation of patients with advanced disease. A thorough understanding of the anatomy and embryology of the colon is imperative in order for surgery to be undertaken successfully. Curative surgical options will vary upon the site of the disease.



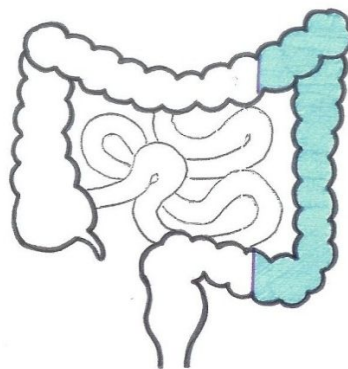
The anatomical location, blood supply and size of the tumour dictate the nature of the resection. The first two factors dictate which segment of bowel to resect and the last factor how radical the resection would be (eg. whether or not an adjacent organ is resected en bloc with the tumour – uterus/stomach/small bowel). Following oncological principles of removing all lymph nodes draining that particular region containing the malignancy dictates that the resection be carried out right down to the root of the blood supply (for that segment of colon), as lymphatic drainage follows a similar pathway to the arterial circulation

Right hemi-colectomy:



This entails the removal of the right half of the colon. This procedure applies to a cancer located anywhere from the caecum up to the proximal transverse colon. Surgery entails removal of the caecum, ascending colon, proximal transverse colon and includes the ileo-caecal valve together with a short segment of terminal ileum. The extent of resection is determined by the blood supply of the R colic artery. Continuity is restored by means of an ileo-colic (ileum to transverse colon) anastomosis. Owing to the good blood supply from the small bowel mesentery and the middle colic artery, this anastomosis is fairly straightforward and not therefore complications such as breakdown and ischaemia are relatively uncommon.

Left hemi-colectomy:



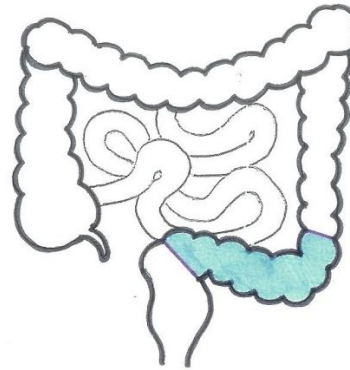
This entails removal of the left half of the colon, for lesions occurring anywhere from the distal transverse colon down to the end of the descending colon. The procedure entails removal of the distal transverse colon as well as the descending colon.

The extent of resection is determined by the blood supply of the left colic artery. In these procedures, continuity may or may not be restored. If the surgery is straightforward and there are no untoward events, then a simple end-to-end colo-colonic (transverse to sigmoid colon) anastomosis is performed.

If there are adverse factors relating to complexity, poor collateral blood supply or technical difficulties encountered during the procedure, then there are alternatives to an anastomosis. An end-to-end anastomosis may be performed with a diverting stoma proximal to the anastomotic site (either a colostomy or ileostomy), this is performed with the intention of temporarily diverting the faecal stream away from the anastomotic site. Once the anastomosis has been assessed as having healed completely, the stoma may be reversed, restoring the continuity of the colon, in an elective setting.

If the surgeon is not keen on performing an anastomosis, a third option exists of maturing the proximal colon as an end stoma. The remaining distal stump is sutured closed and returned to the abdomen. This is referred to as a Hartmann's colostomy. The possibility of reversal of this stoma does exist but will require a repeat laparotomy to be performed in an elective setting.

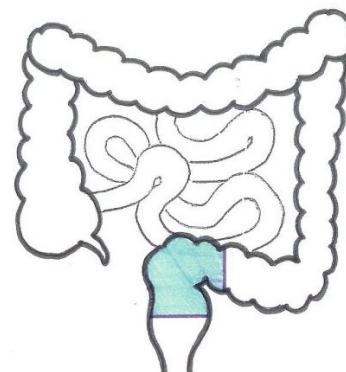
Sigmoid colectomy:



This pertains to removal of tumours within the sigmoid colon. The entire sigmoid colon is removed in accordance with the blood supply of the sigmoidal arteries. Unlike right colectomies, the blood supply of the left colon is slightly more tenuous. This is on account of the blood supply of the left colon which is emanates from the inferior mesenteric artery, which is often diseased and/or occluded by atherosclerosis. As a result, ischaemic complications factor in heavily in the decision to restore continuity. Any of the three surgical options described in left hemi-colectomy may be utilised.

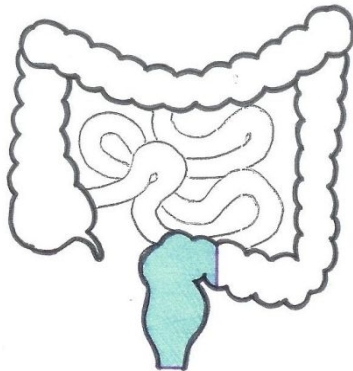
Anterior resection and Abdomino-perineal (AP) resection:

These procedures entail resection of tumours within the rectum. It entails removal of all or part of the rectum. This is determined by the location of the tumour within the rectum.



An anterior resection refers to the removal of the upper part of the rectum for tumours involving the upper and middle thirds of the rectum. The

tumour does not involve the sphincter complex. The surgeon is therefore able to divide the rectum sufficiently distal to the tumour whilst ensuring preservation of the anal sphincter complex. Continuity is established by means of an end-to-end colo-rectal anastomosis. Where the surgery is deemed more complex or where the anastomosis is very low down (at the level of the distal third of the rectum) a temporary proximal diverting stoma is usually employed.



An AP resection is reserved for those lesions involving the distal third of the rectum where the anal sphincter complex is either invaded by tumour directly or likely to be included within our determined margins of resection. In these scenarios, it is unlikely that the patient will be continent following the surgery as the sphincter complex has been compromised, and there is therefore little hope of a good functional outcome. The anus, including anal canal, is excised together with the resected specimen. This comprises the perineal component of the procedure. An anastomosis is therefore not possible and a permanent end colostomy is fashioned.

PROGNOSIS

The prognosis following surgery will vary depending on the stage of disease at histological assessment, as this will influence treatment strategies. The resected specimen is thoroughly analysed by the department of anatomical pathology. Various factors

are taking into consideration and assessed:

- Tumour characteristic (is moderately or poorly differentiated? Is it cancer?)
- Depth of invasion (how far through the bowel wall did it penetrate?)
- Lymph node yield (how many lymph nodes and are they involved?)
- Completeness of the resection margins (is there tumour at the margin?)
- Evidence of advanced disease (are there peritoneal deposits, perineural or lymphovascular invasion)

Primary Tumor (T)	
TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Tis	Carcinoma in situ: intraepithelial or invasion of lamina propria
T1	Tumor invades submucosa
T2	Tumor invades muscularis propria
T3	Tumor invades through the muscularis propria into the subserosa, or into nonperitonealized pericolic or perirectal tissues
T4	Tumor directly invades other organs or structures and/or perforates visceral peritoneum
Regional Lymph Nodes (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in 1 to 3 regional lymph nodes
N2	Metastasis in 4 or more regional lymph nodes
Distant Metastasis (M)	
MX	Distant metastasis cannot be assessed
M0	No distant metastasis
M1	Distant metastasis

Table 1 AJCC TNM Staging System for Colorectal Cancer

Using this information one is able to stage the patient using the TNM classification for colon cancer. This enables categorising the patient's overall cancer risk and survival and thereby dictates treatment strategy.

Stage 1 disease has a very good prognosis. This correlates to tumours that are classified as either T1 or T2, with no evidence of lymph node involvement. These patients are considered cured and have a five year survival exceeding 90%.

Stage 2 disease shares a similar optimistic prognosis. It correlates with a tumour staging of either T3 or T4, with no lymph node involvement. Survival figures approach 80%. There is a significant decrease in survival when compared to stage 1 disease, where the only difference is the size of the lesions. Other tumour factors are thought to contribute to the poorer outcomes in these patients.

Stage 3 disease highlights the involvement of lymph nodes and implies that not all the tumour has been excised. These patients have poorer survival figures and benefit most from adjuvant oncological therapy. 5 year survival approaches 60% in this group.

Stage 4 disease reflects metastatic disease; the tumour has spread to other organs (liver/lung). There is no possibility of cure and these patients should be offered best palliative therapy. 5 year survival is less than 10% for these patients.

The general principle is that stage 1 and 2 disease equates to surgical cure. These patients do not warrant any further treatment except for vigilant surveillance and follow up.

Stage 3 patients benefit the most from adjuvant oncological therapy. Their 5 year survival has increased drastically following the routine use of

chemotherapy as adjuvant treatment in this group.

Stage 4 patients benefit most from palliative chemotherapy. Surgery is not routinely advocated in this group; however there are rare circumstances when surgery may be offered to patients in this group.

Other surgical factors that confer a poorer prognosis to these patients include:

- Tumour present at surgical margins
- Obstructed tumour at presentation
- Poorly differentiated tumour
- Inadequate lymph node yield
- Perineural invasion
- Peritoneal deposits/micrometastases

Patients who meet this criteria are thought to have more advanced disease, hence the poorer outcomes and are often given the benefit of added adjuvant therapy where they usually wouldn't be treated.

SURVEILLANCE

Once a patient has been successfully treated for colorectal cancer, it is important to note that the patient is at an increased risk of developing cancer once more. This may be through the development of a second, metachronous tumour or more often following a recurrence of the initial primary malignancy.

Most recurrences (80%) occur within the first two years following surgery. It is therefore imperative that these patients be closely followed of for any signs and symptoms of recurrent disease.

Tumour markers are very useful in the follow up of such patients. Serial carcino-embryonic antigen (CEA) measurements are a useful adjunct for

monitoring a patients' progress. At the time of diagnosis, the CEA is usually be elevated. Following removal of the tumour, the level should return to normal, and remain at this level. Any elevation of the CEA level from this new baseline should alert one to the possibility of recurrent disease.

Serial imaging (CT scans etc) has not proven cost-effective in the surveillance of colorectal cancer patients. There use is thus reserved for those patients where there is suspicion of recurrence through symptoms or increasing CEA levels.

Colonoscopic surveillance is imperative in the follow up of patients following surgery. Majority of the recurrences occur at the site of previous surgery, the anastomosis. Colonoscopy allows one to accurately assess the mucosa in the vicinity of the anastomosis and rule out any local pathology. It also enables assessment of the rest of the colonic mucosa to rule out any further polyps or tumours elsewhere in the colon. Serial colonoscopy should be performed at 6months, 1 year, 3 years and 5 years following surgery and at 5 to 10 year intervals thereafter.

PALLIATIVE THERAPY

The goal of palliation is to achieve optimal relief from the current symptoms or complications. It entails generous and yet judicious use of the various treatment options available in an effort to render the patient as comfortable as possible.

Palliation should never be considered as a failure of medical therapy. It is important to note that up to 50% of all colorectal cancer patients will develop metastases (25% will present with metastases at first presentation and a further 25% will develop metastases during the course of their treatment). Palliative therapy will therefore entail the mainstay of treatment for a

significant percentage of patients diagnosed with colorectal cancer.

One of the mainstays of palliative care is good analgesic control as pain in advanced malignancies can be quite debilitating. Opioid-based analgesia is the most effective agent as its central activity achieves not only good analgesic control, but a relative state of euphoria as well.

Surgery is not always performed with curative intent, it can be utilised as a palliative treatment modality in those patients where no alternative form of therapy exists. For patients with obstructive symptoms, a proximal de-functioning surgical stoma can achieve considerable palliative relief. It is also of great benefit in the management of advanced rectal cancers where perianal pain and incontinence are the sources of discomfort. In some instances, a palliative resection may be undertaken in an effort to reduce the burden of disease and improve the efficacy of other palliative measures. Palliative resection of advanced tumours is rarely performed currently as patients achieve equivalent outcomes with chemotherapy, without the inherent risks associated with surgery. Such a decision can only be made after careful discussion within the multi-disciplinary team.

Oncology can be utilised as a useful palliative adjunct for those with irresectable or metastatic disease. Chemotherapy and/or radiotherapy are aimed at reducing the growth of the tumour and thereby achieving some form of symptomatic relief. Oncological therapy does not afford the patient the potential for cure. It is merely aimed at reducing the burden of disease. This is achieved mainly through restriction of tumour replication and spread. In doing so, the patient is spared some of the complications of advanced malignancy such as non-metastatic manifestations, obstruction, perforation etc.

Endoscopic stenting is proving an extremely popular modality of treatment for patients considered unsuitable candidates for curative surgery with obstructive symptoms. A self-expanding metal stent (SEMS) is deployed at colonoscopy to traverse the stenotic segment of bowel. With time, the stent will expand thereby dilating the narrow lumen, relieving the obstruction and obviating the need for a surgical stoma. The greatest advantage of a successful stent is that it eliminates the need for unnecessary surgery, thereby minimising the time patients spend in hospital.

ONCOLOGICAL ASPECTS

There are three distinct components to oncological therapy in the treatment of patients with colorectal cancer.

In patients with locally advanced disease, oncological therapy can be utilised to achieve a reduction in tumour bulk and help render a locally advanced tumour resectable. This is termed neo-adjuvant therapy.

In those patients who have undergone surgery with features of advanced disease on histological assessment, oncological therapy can be employed as an adjunct to surgery to enhance overall outcomes and survival. This is termed adjuvant therapy.

Patients with incurable disease are not considered for surgery and are managed by oncology alone with the aim of reducing burden of disease and improving symptoms. This is termed palliative therapy.

The two main modalities of treatment in oncology are chemotherapy and radiotherapy

Chemotherapy is designed to target rapidly growing tissue and inhibit cell replication and growth, thereby minimising tumour growth and spread. This is achieved through targeting various cellular metabolic pathways.

Radiotherapy entails treating a specified tumour field with a focussed beam of radiation energy. The radiation therapy itself is destructive to the tumour tissue and results in disease regression and local control, this effect is usually temporary. Toxic side-effects limit its application.



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