

A Dissertation on

ANALYTICAL STUDY OF FIFTY CASES OF COLORECTAL MALIGNANCIES

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CERTIFICATE

This is to certify that this dissertation in "**ANALYTICAL STUDY OF FIFTY CASES OF COLORECTAL MALIGNANCIES**" is a work done by **Dr.RAJARAJAN .E.P.**, under my guidance during the period 2004 - 2007. This has been submitted in partial fulfillment of the award of M.S. Degree in General Surgery (Branch - I) by the Tamil Nadu Dr.M.G.R. Medical University, Chennai - 600 032.

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INTRODUCTION

Colorectal cancers though most common in the west are on the increase in our country for the past decade. The early detection of the disease is of paramount importance in its outcome. Few topics in cancer research have engendered more excitement, the recent discovery of identifiable genetic defects in patients with inherited as well as sporadic forms of colorectal cancer.

There are evidences that neoplastic disease has affected humans since prehistoric times. Mummies from pre-columbian, Peru of 2400 years as well as Egyptian Mummies from 3000 years BC have metastatic skeletal deposits. It was Hippocratic (460-370 BC) who first proposed a theoretical treatment to explain cancer invasion.

The cellular etiology of cancer was first described by Johannes Peter Muller in 1828.

The following year Joseph Catrude Recaemer proposed that invasion and distant spread were the result of translocation of cells and he coined the term metastasis. The first successful resection of colonic growth was performed by Reynold Lyons in 1823.

After Billroth, Czerny and Mickulicz the pioneer in abdominal surgery familiarized the technique of intestinal resection and anastomosis, increasing number of colonic resections were attempted. The combined operation involving abdominal and perineal phases for excision of rectum was first

performed by Czerny (1883). But it was undoubtedly the work of Ernest Miles (1908) that established abdomino perineal operation.

Cuth berg Dukes (1735) classified carcinoma rectum into three stages and explaining macroscopic variations. These are the widely used by pathologist with minimal changes even now for colorectal cancer staging. Paul of Liverpool (1895) and Mickulicz of Brestan (1903) performed extra peritoneal resection of carcinoma colon and popularized the technique in America.

Halsted (1893) Shoemaker (1921) Ranken (1925) and Vangenstein (1948) various methods of anastomosis by which it was hoped to carry out resection and anastomosis in an entirely sterile manner without opening the bowel lumen till union was completed.

But it was later pointed out Moinihan that factor responsible for sepsis is not contamination during operation itself but subsequent leakage.

Whipple (1931) and Turner (1937) favoured intraperitoneal resection with temporary caecostomy in order to relieve the tension on the suture lines. Devine (1931) developed preliminary defunctioning colostomy which helped mechanical cleaning of distal bowel.

After advent of strong intestinal antiseptic reliance was placed on them entirely and primary colostomy was entirely omitted. Loyld Davis Morgon and Yollinger (1953) carried out resection with immediate anastomosis without any

form of proximal decompression in their series of 109 cases there were only three post operative death and most of them due to sepsis.

In recent years, the trend is towards preparation with mechanical cleansing using balanced salt solutions containing osmotic purgatives in them with antibiotics orally or intravenously. This requires only single day preoperative preparation.

Surgical resection remains the main stay of treatment for colorectal cancers. Radio therapy and chemotherapy are used as adjuvant therapeutic options. Trunbull at Cleveland clinic recommended a no touch technique in which vascular and mesenteric division was first undertaken thereby isolating the tumor.

The roll of gene and their abnormality are being studied extensively and has given as the adenoma to carcinoma model due to accumulation of various genetic defects in form of deletion, translocation, etc. These may help us to found appropriate diagnostic tool to look for such aberration early preventing cancer progression.

Colorectal surgery has advanced a lot with introduction of GIA stapler especially for sphincter saving procedure for carcinoma rectum with advent of Laproscope, Laproscopy assisted resection procedures are also being carried out.

AIM OF STUDY

To study the pattern of

- Incidence, Age, Sex and site.
- Etiopathogenesis
- Clinical presentation
- Treatment modalities
- Adjuvant therapy
- Role of minimal access surgery
- Recent advances in management
- Follow up of colorectal carcinoma in Govt. Royapettah Hospital, Chennai.

SURGICAL ANATOMY OF LARGE INTESTINE

COLON AND RECTUM

The large intestine extends from end of ileum to Anus and comprises of caecum (with appendix) colon, rectum and anal canal, measuring between 110-170 cm in on an average 135 cm. Long its caliber is great at its commonest caecum and gradually diminished as it is traced distally. But becomes more dilated in the lower most part of rectum just above collapsed anal canal.

EMBRYOLOGY

The large intestine develops from both midgut and hindgut. Midgut portion extends from caecum to proximal 2/3 of transverse colon supplied by superior mesenteric artery, Hindgut from distal 1/3 of transverse colon to proximal anus supplied by inferior mesenteric artery. The distal anal canal ectodermal origin supplied by internal pudendal vessels.

Large gut start developing by 5th week of gestation and is completed by 8th week of gestation, when anal membrane ruptures during 6th week, migration and midgut rotation occurs over 4 weeks, assuming final anatomical position by 10th week of gestation.

ANATOMY

THE CAECUM

The caecum lies in right iliac fossa, approximately 7cm in length and width. Proximally becomes ascending colon at its junction with terminal ileum guided by a valve which prevent reflux (contains muscle). It lies on iliac and psoas muscle and on genitofemoral, lateral cutaneous nerve of thigh its exact position is variable may extend into true pelvis. It is almost completely enveloped by peritoneum often attached to iliac fossa medially and laterally.

THE ASCENDING COLON

It varies from 10-20 cm an average 15cm approximately. It lies on iliac muscle, iliac crest and Quadratus Lumborum and crosses lateral cutaneous nerve of thigh, this inguinal and the hypogastric nerves. It is usually covered with peritoneum on all 3 sites except posteriorly, where it is fixed to posterior abdominal wall. Some times it may be fixed by short mesentery. It ends at hepatic flexure where it turns left on lower portion of right kidney.

THE HEPATIC FLEXURE

At this point, colon turns sharply medially and slightly forwards downwards just below right lobe of liver and overlaps the lower aspect of right kidney.

THE TRANSVERSE COLON

It is the longest of all, varying from 40cm – 70cm in length extending from hepatic flexure to splenic flexure forming dependent loop between the points. It is suspended by transverse mesocolon which is attached to descending part of duodenum, lower aspect of body of pancreas and anterior surface of left kidney.

It contains middle colic vessels and branches of left colic artery, right colic artery and lymphatics. Its posterior relation from right to left are anterior surface of descending duodenum, small intestine, part of left kidney. Just below the spleen it turns to form splenic flexure.

SPLENIC FLEXURE

It is junction of transverse and descending colon in left hypochondrium. The turn is so acute, transverse colon overlies it anteriorly. Relation to spleen and pancreatic tail superiorly and front of left kidney medially attached to diaphragm level with X,XI, ribs viz. phrenicocolic ligament which lies below anterolateral pole of the spleen.

THE DESCENDING COLON

It extends from splenic flexure to rim of true pelvis close to inguinal ligament from where it continues as sigmoid measuring 25 cm. attached to

posterior abdominal wall by peritoneum in left vertebral gutter, and left Iliac fossa. It rests on some muscle and related to same nerve as ascending colon.

At anterior superior iliac spine, it turns medially superior to inguinal ligament and lies on femoral nerve, psoas muscle, genital vessels, becomes sigmoid colon anterior to external iliac vessels.

SIGMOID COLON

It is most variable part measuring 40-80cm length and in its mobility. Extends upto rim of true pelvis where it becomes rectum. Suspended by sigmoid mesocolon a long mesentry with short base.

The position, shape vary very much depending on

- A. Its length
- B. Length and mobility of mesocolon
- C. Degree of distension
- D. Condition of rectum, bladder, uterus.

THE RECTUM

This in true pelvis measuring about 12-15cm with diameter of 4cm when empty. It is dilated in lower part to form rectal ampulla.

It follows curve of sacrum and coccyx in saggital plane. In coronal plane it is shaped giving rise to prominent folds in the lumen known as Houston's valves. The relationship of pelvic peritoneum to rectum is of considerable surgical importance. The upper third has a complete peritoneal investment except for a thin strip posteriorly, where peritoneum reflected as the through the leaves of thick mesorectum. As rectum descends into pelvis, the uncovered portion becomes wider until only anterior aspect has peritoneal coat in middle 1/3 of rectum extraperitonealy. Posteriorly parietal pelvic fascia, thickened to form fascia of Waldeyer's separating rectum from coccyx and sacrum, blood vessels and nerves. Anteriorly separated from fascial layers known as Denon viller's fascia.

The upper, 2/3 rectum is separated form pelvic fascia by posterior cushion of areolar tissue which becomes circumferential below rectovesical/rectouterine pouch carrying blood vessels and its lymphatics, known as mesorectum.

THE ANAL CANAL

It is about 4cm long, with its anterior wall shorter than posterior one when empty lumen is triradiate, longitudinal slit or saggital posteriorly anococcygeal ligament separate from coccyx. While inferiorly perineal body separates from membranous urethra, penile bulb or lower vagina, laterally are ischiorectal fossa. It's whole length surrounded by sphincter which keeps it closed.

The mucosa of canal consists of an upper mucosal and lower cutaneous part. The junction being marked by line of anal valves about 2cm from anal orifice known as dentate line or pectinate line.

BLOOD SUPPLY AND LYMPHATIC DRAINAGE

These are important subjects in relation to malignancy and its treatment.

BLOOD SUPPLY

The main arteries supplying colon, rectum are superior mesenteric Artery, inferior Mesenteric Artery, Middle and inferior rectal artery. The caecum, Ascending colon, hepatic flexure, proximal two third of transverse colon derives, blood supply from superior mesenteric artery originating from Aorta at L2 level via ilio colic, right colic, middle colic vessels. The distal third of transverse colon, splenic flexure, descending colon, sigmoid and upper third of rectum viz. Inferior mesenteric artery arising from Aorta at L3 level via left colic, sigmoid branches, and superior rectal artery. The distal two third to

rectum, anal canal gets blood supply via middle, inferior rectal artery of internal iliac artery.

The main colic arteries proceed to colon and bifurcate to form branches which form arcades, an inch or so from mesenteric border. So that continuous chain of communicating vessel is formed. This is the marginal artery from which ultimate branches supply to the colon, the vasa recti are distributed.

These branches ramify between and supply muscular layers, divide into small submucosal rami and enter the mucosa. The marginal artery is responsible for area of supply of superior mesenteric artery into communicating with that of inferior mesenteric by connecting the descending branch of middle colic with ascending branch of left colic by mean of long anastomosis of colon.

The venous drainage follows its arterial supply empties into portal venous system. The inferior mesenteric vein diverges from artery and passes behind pancreas to drain into splenic vein.

Splenic vein and superior mesenteric vein join behind neck of pancreas to form portal vein which drains the blood into liver.

LYMPHATIC DRAINAGE

The entire colon and rectum are drained by a large number of lymphnodes 70-100 which are present as a series draining into principal nodal group.

A. INTRAMURAL LYMPHATICS

Throughout colon and rectum continuous lymphatic plexus, in submucous or subserous layers of bowel wall are inter connected and drain into extramural lymphatics.

B. EXTRAMURAL LYMPHATICS OF COLON

These consists of lymphatic channel and glands divided into 4 groups.

Epicolic: Mesenteric nodes on colonic wall sometimes in appendices epiploicae.

Paracolic: Along medial borders of ascending colon and descending colon.

Intermediate Colic: Nodes alike along right, middle, left, ilio colic arteries.

Pre terminal Colic : Nodes adjoining main branches superior, inferior mesenteric arteries near their corresponding pre aortic nodes. These nodes ends in pre Aortic nodes, which drain into para aortic groups and hence is a efferent channels to thoracic duct with internal jugular vein.

C. EXTRAMURAL LYMPHATICS OF RECTUM

Likewise lymphatic drain to pararectal group in contact with wall of rectum, hence to intermediate group around main arterial for (superior rectal artery) and hence nodes near origin of main vessels.

From upper half of rectum, lymphatic flows to para aortic nodes, from thence to superior rectal nodes, which drain to nodes in lower sigmoid colon, thence to inferior mesenteric artery nodes.

Laterally along middle haemorrhoidal vessels, on either side to ischio-rectal fossa, and thence to internal iliac glands, via inferior rectal and internal pudendal vessels (above mucocutaneous junction).

Lymphatics of anal canal below dentate line, descend to anal margin, curves laterally to reach medial superficial inguinal lymph nodes.

INCIDENCE AND EPIDEMIOLOGY

It is dynamically changing disease entity due to multifactorial reasons. It is predominantly tumour of old age > 50 years can occur in young individuals (genetic inheritance) Ninety percent of carcinoma occur in people more than 50 years old. There is definitely male pre-ponderance (more in rectal carcinoma than colonic Ca). Averaging 1.3 to 1.8% sex ratio. In our country in population, oral cancer tops the list in male while ca cervix in female. Colorectal malignancies occupy 6th place with male and female being roughly equal.

The incidence of cancers is much higher in western countries, suggesting environmental and genetic factors. The frequency has been increasing in our country over last few years, possibly related to changing dietary social habits.

It is observed from early statistics Swidly, Golinger, (1967) that rectosigmoid accounts for more than half of cases of colorectal cancers. Now there is progressive trend toward disease of right colon, and lower left colon and rectal cancers. (Carely person, 1977, Steele GD 1979).

The distribution of the disease Worldwide seems to be related to industrialization & socioeconomic standard. There is high incidence in industrialized countries like Western Europe etc. Now, increasing incidence with lower Socioeconomic groups. The frequency has been increase in our

country over last few years, possibly related to changing dietary and social habits. Although colorectal cancer can occur at any age, the incidence only starts to become appreciable over the age of 50 and disease occurs maximally in the decade between 70 and 79 years.

Though there is slight preponderance in male (mainly rectal carcinoma than colonic carcinoma) colorectal cancer affects an almost equal proportion of men and woman.

Colonic cancer deaths are more frequent in women than in men (11: 7) but death from rectal cancer is slightly more frequent in men (6:5).

The majority of colorectal cancers (75%) are in the rectum and sigmoid colon. The descending colon and transverse colon are rare site of tumor formation. Where as in the ascending colon and caecum the incidence is slightly higher. In recent years, there appears to be slight increase in the proportion of tumors on right side of colon.

Carcinoma rectum accounts for nearly 1/3 of all cancers followed by sigmoid colon, cancer caecum and recto sigmoid junction, followed by others.

In rectum great controversy exists so or to distribution of cancers. According to statistics 36% growth upper third, 29.8% middle third, 28% lower third.

ETIOPATHOGENESIS

The aetiology of colorectal cancer can be seen as an interaction between genetic (inherited) and environment factors but the basic underlying cause appears to be an accumulation of genetic mutations. Majority arises from pre existing adenomatous polyps. The supporting evidence are mutation of APC gene, mutation of K-ras gene, mutation in p 53 gene, deletion in DCC gene.

INHERITED GENETIC FACTORS

About 10 to 15% of colorectal cancers are familial. Germline mutation of APC gene lead to FAP and germline mutation of the DNA mismatch repair genes give rise to hereditary non polyposis colorectal cancer (HNPCC) syndrome.

HEREDITARY NON PLOYPOSIS COLON CANCERS

Warthin in 1913 recognises increased incidence of cancer, in families. With Lynch characterising those cancer Prone families which was not associated with multiple polyps hence the name.

Two distinct clinical presentation were made out.

Lynch syndrome -I - Site specific proximal colon cancer in family.

Lynch syndrome - II – Characterised by development of colorectal, endometrial, gastric, upper Urinary tract, Ovarian and other malignancies.

Both groups are defined using Amsterdam criteria. These families found to have micro satellite instability in genes due to mutation in mismatch repair genes.

FAMILIAL ADENOMATOUS POLYPOSIS

FAP is a dominantly inherited condition characterized by the appearance of multiple adenomatous polyps throughout the colon which inevitably leads to colorectal cancer by the fourth decade of life. It is caused by germline mutation of APC gene located on chromosome 5q.

Extra colonic features are adenomas and carcinoma of the small bowel & particularly the peri ampullary area of the duodenum, Congenital Hypertrophy of retinal pigment epithelium (CHRPE) 70 – 80%.

VARIANTS OF FAP

1. Attenuated adenomatous polyposis coli .
2. Hereditary flat adenoma syndrome.

Other in the spectrum of hereditary polyposis syndrome are

- a. Gardner's syndrome** – Colonic polyposis, Epidermal inclusion cyst, Osteoma of bone, upper G.I tumors.
- b. Turcots syndrome** – colonic polyposis with brain tumors (medulloblastoma).

ENVIRONMENTAL FACTORS

Diet

Dietary fibre may be protective against colorectal cancer. Diet rich in animal fats increase the excretion of bile salts in the faeces and promote the growth of bacteria that are capable of degrading bile salts to carcinogens. Studies showed that diet with < 5% fat, have lower incidence of colorectal cancer.

Cooked meat may also have carcinogenic influence owing to heterocyclic amines.

Diet lacking in vegetables is also a risk factor for colorectal cancer.

Deficiency of components such as calcium, Vitamin D, A and Vitamin C, tocopherol, selenium and dietary fibre may be associated with increased incidence due to absence or decreased protective effect.

Bile Acids

Bile acids may be carcinogenic and it is related to calcium in the diet.

Bacteria

There is now some evidence that intra epithelial E.Coli is strongly associated with presence of polyps and colorectal cancer.

There is also association between H.Pylori Colonization of the stomach and colorectal cancer (due to Hypergastrinemia).

PRE DISPOSING CONDITIONS

1. Inflammatory bowel disease

Long standing inflammatory bowel disease (both ulcerative colitis and crohn's disease) increases the risk of developing colorectal cancer.

Previous gastrectomy or vagotomy may also play a role, Uretro sigmoidostomy is a well established risk factor.

2. Polyps

Adenomatous polyps more than 2 cm in size, patient with multiple polyps, villous adenoma when compared to tubular one has increased incidence.

3. Pelvic radiation

Supportive but inconclusive evidence found between radiation and colorectal cancer. Overall risk is very small.

4. Previous malignant disease

Patient who underwent treatment for cancer large bowel have three fold risk of second endorectal malignancy.

PATHOLOGY

Macroscopic appearances

There are four distinct macroscopic types.

Polypoidal type

The polypoidal variety takes the form of a fungating mass and is more common on the right side of the colon than on the left side. It has the best prognosis.

Ulcerative type

Appears as a typical malignant ulcer with a raised everted edges and a necrotic base. These tumors predominate on the left side of the colon and in the rectum. It has intermediate prognosis.

Annular type

These lesions which encircles the colonic or rectal lumen, probably develops a malignant ulcer that gradually extends around the bowel wall until the two edges meet commonly seen in the left sided growth.

Mucinous or colloid type

It is a bulky tumor with a gelatinous appearance . Worst prognosis.

HISTOLOGIC TYPES

The most common type is adenocarcinoma.

The other types are:

Mucinous adenocarcinoma.

Signet ring cell adenocarcinoma

Squamous cell carcinoma

Adenosquamous carcinoma

Undifferentiated carcinoma

Carcinoid tumors

Non Epithelial tumors

Well differentiated carcinoma has good prognosis and poorly differentiated type has worst prognosis.

DUKES AND BRODER SYSTEM OF HISTOLOGIC CLASSIFICATION

BRODER		DUKES
GRADE I	Active epithelial proliferation with infiltration of muscularis mucosa – resembling adenoma.	Low grade malignancy
GRADE II	Crowded cells with regular arrangement, frequent mitosis	Average grade malignancy
GRADE III	Less differentiated with increased mitosis, crowded in irregular rings.	High grade
GRADE IV	Anaplastic with no glandular enlargement. Deep invasion with column of cells.	High grade

MODE OF SPREAD

Spreads by

1. Local spread
2. Lymphatic spread
3. Haematogenous spread
4. Trans peritoneal spread

Local spread

Spread is three dimensional, occurring in the longitudinal and transverse axis as well as radially through the bowel wall and into the tissues around the colon and rectum. The degree of longitudinal intramural spread is important as it determines what a safe margin of resection should be.

Lymphatic spread

It is the most common mode of spread. Lymphnodal metastasis occurred only after lumen has penetrated into perirectal colonic tissues. Lymphatic spread occurs in an orderly fashion. The lymphatic drainage of colon follows its blood supply.

Haematogenous spread

The liver is primary site of haematogenous spread followed by lungs in colonic cancer. As venous drainage of rectum is via dual systems, liver and lungs are involved primarily depending on site of tumour origin, in rectum.

Batson's vertebral venous plexus represent another way of blood spread metastasis to bone and CNS.

Transperitoneal spread

Associated with grave prognosis. Mucinous cancers are most prone to spread in this manner.

STAGING AND CLASSIFICATION

DUKES' STAGING

- A. Growth limited to colonic/rectal wall but not through
- B. Growth penetrating through bowel wall
- C. Involvement of lymph nodes regardless of extent of bowel
Wall penetration

1935 Modification

- A,B as Same
- C - C1 - Locally positive nodes
- C2 - Positive nodes at point of ligatures

KIRKLIN MODIFICATION

- A1 - Tumour limited to mucosa
- Duke - A - Submucosa only
- B1 - Tumour infiltrated into but not through
Muscularis propria
- B2 - Tumours infiltrating to muscularis propria

DUKE

- C - Renamed same
- D - Defined as disease beyond limit of surgical
Resection (Turn bull addition)

ASTLER COLLINS MODIFICATION

- A - Limited to mucosa
- B1 - Extending into but not through in propria uninvolved nodes
- B2 - Extending into muscularis propria with uninvolved nodes.
- C1 - Extending into but not through muscularis propria involved nodes.
- C2 - Extending through muscularis propria with involved nodes

This staging allowed separation of wall penetration and nodal status.

TNM CLASSIFICATION

The AJCC has recommended TNM classification which covers all possible Presentation.

PRIMARY TUMOUR

Tx - Tumour cannot be assessed.

To - No evidence of primary tumour in resected specimen.

Tis - Carcinoma in situ

T1 - Tumour invade submucosa

T2 - Invade muscularis propria

T3-4 - Depends on presence/absence of serosa

SEROSA PRESENT

T3- Invades through muscularis propria into serosa (serosa not Through)

T4 - Invades through serosa into free peritoneal cavity or into contiguous organ.

SEROSA ABSENT

(Distal 2/3 rectum: posterior right and left colon)

T3 - Invades through muscularis propria

T4 - Invades other organs

REGIONAL LYMPH NODES

Nx - Nodes cannot be assessed

No - No regional node metastasis

N1 - 1-3 positive nodes (pericolic or perirectal)

N2 - 4 or more positive nodes

N3 - Central nodes positive

DISTANT METASTASIS

Mx - Presence of distant metastasis cannot be assessed.

Mo - No distant metastasis

M1 - Distant metastasis present

STAGING

Stage 0	-	Tis	No	Mo
Stage 1	-	T1-2	No	Mo
Stage II	-	T3-4	No	Mo
Stage III	-	Any T	N1-2	Mo
Stage IV	-	Any T	Any N	M1

JASS SYSTEM

Takes into account the degree of lymphocytic infiltration at the advancing margin of the tumour and the configuration of the advancing margin. Its prognostic usefulness appears to be restricted to rectal cancer.

CLINICAL FEATURES

There are 3 main ways of carcinoma of large intestine present.

- a. As non emergency cases, with insidiously developing chronic symptoms chiefly affecting bowel function and general health.
- b. As emergencies with perforation/obstruction of colon with or without peritonitis.
- c. Non specific symptoms

The common symptoms are

- Altered bowel habits with form of alternating diarrhea and constipation, tenesmus, etc.
- Sense of incomplete evacuation
- Bleeding per rectum
- Mucus per rectum
- Mass per rectum
- History of piles or haemorrhoids
- Abdominal pain/dyspepsia
- Loss of weight, anaemia, asthenia, impairment of general health

- Loss of appetite
- Flatulent distension
- Acute or chronic bowel obstruction
- Bowel perforation and peritonitis

CARCINOMA OF CAECUM AND ASCENDING COLON

Most present with anaemia, severe and unyielding to treatment. A palpable tumour may be present sometimes discovered unexpectedly at operation for acute appendicitis for an appendicular abscess failing to resolve. Sometimes carcinoma of caecum can be apex of an intususception present with intermittent obstruction.

CARCINOMA OF TRANSVERSE COLON

It may be mistaken for stomach cancer due to position of tumours together with anaemia with lassitude.

CARCINOMA OF LEFT SIDE COLON

Majority of tumours occur in this location. They are usually of stenosing, annular, ulcerative type. The main symptoms are those of increasing intestinal obstruction. Colicky or constant aching pain may be the only

symptom. Alteration in bowel habits, palpable lump, abdominal distension are the other symptoms.

CARCINOMA OF RECTO SIGMOID

Colicky pain, tenesmus are the usual symptoms of rectal carcinoma, presents usually with bleeding per rectum, sense of incomplete defaecation. Tenesmus and alteration in bowel habits.

Subacute intestinal obstruction may induce colicky pain abdomen.

History of piles may be the presenting complaints. Symptom pertaining to local or distant spread may be the initial presentation in some, may present as fistula in ano single or multiple discharging pus.

CARCINOMA OF ANAL CANAL

Commonly presenting early with bleeding per rectum pain in anal region, mass per anal region, patient may present with constipation. May also present as fistula in ano, may be mistaken may left behind giving rise to obstruction, intestinal distension.

COLORECTAL CARCINOMA PRESENTING WITH ACUTE OBSTRUCTION

In about 1/5 of patients complete obstruction occurs, either an aggravation of chronic affairs as acute on chronic obstruction or may present

one day suddenly as pain, distension of abdomen, the narrowed lumen plugged by a faecolith, hard stools, undigested fibres.

Chronic obstruction is more commonly encountered with left colonic carcinoma rather than right sided lesion. Constricting stenosing types seen more on left side and faecal matter produce greater occurrence of acute obstruction.

SYMPTOMS

Complete obstruction of large bowel is often entirely insidious, in onset. If acute on chronic variety with development of acute obstruction the patient finds he is constipated without passing motion for 2-3 days despite use of aperients. He is not able to get rid of flatus and with progressively increasing abdominal discomfort and distension over a period of 6-7 days before finally presenting to hospital.

CARCINOMA OF COLON WITH BOWEL PERFORATION

Colonic perforation occurs in 3-8% patients with colorectal cancers. It is often the result of obstruction symptoms prolonged followed by perforation. The common belief was that perforation takes place in stercoral ulcer usually in the caecum and less commonly closer to growth. But in a series of 115 cases of carcinoma large intestine presenting with perforation only 20 cases of this type were found. While majority was proximal to an obstructing cancer producing localized abscess or generalized peritonitis.

INVESTIGATIONS

Routine laboratory investigation to be done includes complete Haemogram, Blood sugar, Blood urea, Serum Creatinine and Electrolytes, Urine routine examination, ECG, X-ray chest PA, X-ray abdomen, Liver function test to assess the general condition of the patient and treatment of those abnormalities to allow treatment of cancers.

DEFINITE TEST FOR DETECTION / DIAGNOSIS OF COLORECTAL MALIGNANCY

Test for Occult Blood

Guaiac test detects 20 mg haemoglobin per gram or 20ml of blood per day.

Immunofluorescent test detects 5-10 mg of haemoglobin / gm of stool.

RECTAL EXAMINATION

- * Reaches 8 cm above dentate line
- * Detects 20% of colorectal cancers

PROCTOSCOPY

Very much useful for outpatient procedure, biopsy can be taken for palpable tumours.

ENDOSCOPY

Rigid Sigmoidoscopy

- * 25cm long reaching 20-25cm from dentate line detects 20-25% of colorectal tumours.
- * Allows accurate localisation of rectal tumours in terms of both distance from the anal canal and quadrant.
- * Useful in planning transanal excision of tumour and taking biopsy.

Flexible sigmoidoscopy

- * Reaching upto splenic flexure
- * Done after 2-3 preparatory enemas
- * Should be supplemented by a barium enema for complete study.

COLONOSCOPY

Visualisation upto terminal ileum. It allows biopsy, polypectomy and stricture dilation.

DOUBLE CONTRAST BARIUM ENEMA

90% sensitive and cost effective.

STAGING INVESTIGATION

To determine the extent of tumour and particularly whether or not there are distant metastasis.

- * Chest X-ray PA
- * Ultra sound abdomen
- * CT Scan abdomen

CT SCAN

It allows preoperative evaluation of metastasis and local extent of the lesion, integrity of urinary tract.

MRI SCAN

Newer technique and more specific for differentiation of cancer from the normal tissue.

It is a sensitive means of detecting liver metastasis.

The phased array pelvic coils gives very high definition images of the rectum and meso rectum and may prove to be the most accurate method of preop staging of the rectal tumours.

ENDO RECTAL ULTRASOUND

Useful in distinguishing between benign and malignant tumours and between T2 and T3 tumours.

PET SCAN

It is still under investigation

TUMOUR MARKERS

CEA Assay : Thomson et al. (1960) developed RIA, capable of detecting minute quantities of CEA in serum. Will be useful to monitor patient who had radical surgery to find out recurrence of disease.

IMMUNOSCINTIGRAPHY

Specificity 90% accuracy 72% (RIGS) radio immunoguided surgery utilizes radiolabelled antibody to localise tumour by using hand held Gamma Camera.

BIOPSY

Histopathological examination.

SCREENING INVESTIGATION

1. Faecal occult blood
2. Flexible sigmoidoscopy
3. Air contrast barium enema
4. Colonoscopy

TREATMENT

- * Multi disciplinary approach Consists of surgeons, oncologist, pathologist, radiologist and stomatherapist

The various modalities of treatment are

1. Surgery
2. Radiotherapy
3. Chemotherapy

Surgery

Surgical resection is the mainstay of treatment and best palliative treatment modality.

Preoperative Bowel Preparation

As larger intestine contains most pathogeneic bacteria, surgery performed on bowel is classified as (1) clean, (2) contaminated surgical procedures. The steps to be taken.

Mechanical Cleansing

Low residue diet with laxatives and purgatives. Most commonly Mono, Dibasic sodium phosphates, polyethylene glycol with suitable oral or parenteral antibiotics administration. For Emergency surgical procedures on table lavage is given.

Surgical Technique

- * Techniques to minimize tumour spillage remove adequate bowel length and bowel continuity restoration are as important as surgery.
- * The abdomen opened and tumours is assessed for resectability are:
- * Palpating for liver secondaries by visual, palpatory, intraoperative ultrasound if available.
- * Palpate peritoneum, draining lymphnodes, mobility and fixity of tumour, to adjacent or abdominal wall structures.
- * Radical excision of the affected section of colon along with its vascular pedicle and accompanying lymphatic drainage.
- * When a colonic tumour is involving other structure it may still be possible carry out a curative resection by en-bloc removal of the tumour along with involved organ.
- * When a tumour of the colon is truly inoperable, carry out an ileocolonic bypass for tumour on the right side and a defunctioning colostomy for distal colonic cancer.

ANATOMICAL RESECTION OF COLON CANCER AT DIFFERENT SITE

Tumour location	Vascular ligation	Bowel Resection
Caecum, Ascending colon	Ileocolic , right colic	Right hemicolectomy
Hepatic flexure, proximal transverse colon	Ileocolic, right colic, middle colic	Extended right hemicolectomy with omentectomy
Distal transverse colon, splenic flexure	Ileocolic, right colic, middle colic, left colic	Extended right hemicolectomy with omentectomy with left hemicolectomy
Decending colon	Inferior mesenteric or left colic	Left hemicolectomy
Sigmoid colon	Inferior mesenteric	Left hemicolectomy with sigmoid resection
Rectum	Inferior mesenteric, haemorrhoidal	Abdominoperineal resection anterior resection

Toget tumour free margin usually 2.5 cm margin clearance is ideal and anastamosis may be end to end or end to side which should be tension free.

SURGERY FOR RECTAL CARCINOMA

In surgical treatment procedures rectal cancers are considered in 3 distinct regions on relation to anal verge. Section of roughly 5 cm intervals.

Most important principle of rectal cancer surgery is **mesorectal excision**.

UPPER 1/3 LESIONS

Usually in treatment of cancers of distal sigmoid and intra abdominal rectum (Rectosigmoid) usually anterior resection, lower anterior resection done with restoration of intestinal continuity with sutures/ staples.

MIDDLE THIRD LESIONS

Can be treated by both abdomen and perineal resection of sphincter saving procedures. It depends on tumour location, infiltration craniocaudal spread with restoration of intestinal continuity in later procedures.

LOWER THIRD LESION

Most of the tumours require abdominoperineal resection with rarely lesion allowing abdominosacral resection, or anterior resection.

For lower 2/3 lesions, a **total mesorectal excision** should be carried out.

Tumour free margins are achievable for colon cancers and usually a margin of 5 cm deemed adequate.

Since < 2.5% of tumour have intramucosal spread to more than 2 cm. During low anterior resection distal margin of 2 cm is deemed adequate for well differentiated.

When synchronous colonic cancers are found of different sites in the colon, the preferred procedure is subtotal colectomy, resection of contiguous organs for locally invasive tumours is approximately 10% of case. Most

commonly involved organs are bladder, ovary, ureter, abdominal wall, less frequently small intestine, spleen, pancreas, stomach, uterus.

SURGICAL INTERVENTION IN EMERGENCY PRESENTATION

Various modalities available

- * Primary resection with exteriorisation of both ends
- * Hartmann's procedure
- * Primary resection with anastomosis
- * Primary resection with anastomosis protected by defunctioning colostomy or ileostomy
- * Sub total colectomy with ileosigmoidostomy.
- * Endoscopic or radiological guided expanding metal wall stents (left sided obstructive lesion).

ROLE OF MINIMAL ACCESS SURGERY

Minimal access surgery in the form of endoscopic polypectomy or tumour excision or available. They are claimed to facilitate patients convalescence, reduces stress, immunosuppression.

- * Laproscopic abdomino perineal resection
- * Laproscopic anterior resection
- * Transanal endoscopic microsurgery (for small rectal cancers)

ADJUVANT TREATMENT FOR COLORECTAL CANCERS

Radiotherapy

- * Adjuvant radiotherapy
- * Palliative radiotherapy

The role of radiotherapy is well defined in rectal carcinoma than colonic carcinoma. This is due to variation in local presentation after surgery. In colonic carcinoma, the failure site is abdominal rather than local site which makes radiotherapy less feasible. In rectal cancers local failure is most common presentation making adjuvant radiotherapy worth while.

Postoperative irradiation usually 4500-5000 CGy is delivered over 5-7 weeks period and little complications results during preoperative and complications are more after postoperative irradiation.

Radiotherapy can be applied using brachytherapy and teletherapy. Most commonly used teletherapy are global therapy and neutron beam irradiation.

Chemotherapy

- * Adjuvant chemotherapy
- * Palliative chemotherapy

Colorectal cancers are usually been resistant to chemotherapeutic agents. It is most commonly given following surgical procedures.

Hence maximum response is obtained for post operative regimen usually for stage II disease with no significant improvement in patient with stage II disease. Most experimental drugs are 5 fluorouracil or 5 fluorouracil with levamisole combination. The most promising drug is 5 fluorouracil which acts as radioensitiser in chemoradiation technique.

Topoisomerase inhibitor, irinotecan is used in treatment failure with 5 - fluorouracil.

Capecitabine, a new drug is also tried.

Delivering chemotherapy via a hepatic artery catheter for patients with liver metastasis is under trial

Immunotherapy

Commonly used agents are levamisole, BCG vaccination, autologous vaccine (irradiated autologous tumors cells with BCG).

TREATMENT OF METASTATIC DISEASES

Hepatic metastases

It is important to biopsy liver metastasis for histological diagnosis. Patients upto 2 to 3 liver metastases confined to one lobe of liver may be offered liver resection. They are not usually resected at the time of colonic surgery. Multiple painful hepatic metastasis can be palliated by cytotoxic drugs, cryotherapy and laser therapy.

MATERIALS AND METHODS

Cases of colorectal carcinomas collected during the period of September 2004 to August 2006 of 24 months are utilized for this Study. A total No. of 50 cases of which 8 presented as Emergencies.

Detailed history was elicited from each patient with special preferences to family history habitations and early symptomatology. Thorough physical examination was performed for evaluation of General condition, detection of signs and per rectal examination for all patients.

Thorough lab investigation were done in every patient except those who presented Emergencies underwent contrast radiographic studies. Colonoscopic evaluation and CT abdomen done in selected cases. Chest x-rays taken for all patients for preoperative evaluation as well as detection of secondaries. Liver function test done as a routine test to assess nutritional status of patient.

For all possible cases, preoperative biopsy taken via proctoscopic, colonoscopic guidance and histologic type made out before planning treatment. Detailed Histopathological reports were available for staging tumor and assessing the grade differentiation.

PROFORMA FOR STUDY OF COLORECTAL MALIGNANCIES

Name:

IP No:

Case No.

Age :

Unit :

Sex :

I. PRESENTING COMPLAINTS

1.	Lower abdominal pain	
2.	Bleeding per rectum	
3.	Tenesmus	
4.	Abdominal distension	
5.	Alteration of bowel habits	
6.	Mucous per rectum	
7.	Lump in the abdominal	
8.	Lassitude	
9.	Others	

II Past History

III Personal History

Appetite

Weight Loss

Dysuria

Difficult in defecation

Alcoholic

Smoker

Beetlenut chewer

Vegetarian / Non Vegetarian

IV. Treatment History

V. General Examination

1. Built
2. Nourishment
3. Performance Status
4. Pallor
5. Icterus
6. Clubbing
7. Cyanosis
8. Pedal oedema
9. Lymphadenopathy

Vital signs

Pulse Rate

Blood Pressure

Respiratory Rate

VII Local Examination

Per rectal / pervaginal examination

VIII Other symptoms

CVS

RS

IX Specialist Opinion

X Basic Investigation

Complete haemogram

Hb % PCV

TC

DC

ESR

BLOOD

Urea

Sugar

Serum

Creatinine
Electrolytes

Urine – Alb.

Sugar

Deposits

Liver function test

Bilirubin

Direct

Indirect

AST

ALT

SAP

ECG

Serum Proteins

Albumin

Globulin

ECG

X-ray Chest PD

X-ray abdomen

XI. Special investigation

Barium meal series

USG, abdomen pelvis

Colonoscopy

CT abdomen and pelvis

HPE

Barium enema

XII Diagnosis

XIII Treatment

XIV Follow-up

OBSERVATION AND DISCUSSION

In this series of 50 cases of colorectal carcinomas the following observations were made.

RISK FACTORS

Diet

Only 15 no. of cases were pure vegetarians. The majority were illiterate, they could not specify the exact dietary constituents they have taken. But most patients gave history of consumption of fat fibre intake was moderately adequate in most patients.

Tobacco

44 patients out of 50 were using tobacco in form or other. All the male except one were regular smokers, smokes beedi, cigarettes, 15 out of 21 female patients were using tobacco in the form of tobacco and pan masala.

Incidence

Most of the case are from middle and older age groups. Maximum incidence was in 5th decade, youngest patient recorded is 21 yrs.

SEX

Incidence was relatively more in males. M : R is 1.5:1. Incidence is nearly equal in rectal carcinoma. With slight preponderance to male in other carcinomas.

AGE INCIDENCE

Range	Male	Female	Total	Percentage
20 - 30	5	2	7	14%
31 - 40	5	2	7	14%
41 - 50	7	7	14	28%
51 - 60	9	6	15	30%
61 - 70	3	-	3	6%
> 70	3	1	4	8%

SEX INCIDENCE

Male	Female
29	21

Male : Female = 29 : 21 = 1.4 : 1

SITE INCIDENCE

Right	Left
18	32

SITE

Carcinoma rectum accounted for majority of cases. In 50 patients, 23 patients were carcinoma rectum. The distribution of tumors in other sites in decreasing order of frequency were as below :

Ascending colon	-	10
Sigmoid colon	-	6
Caecum	-	6
Hepatic flexure	-	2
Anal Canal	-	2
Splenic flexure	-	1

18 out of 50 were right sided lesions.

MODE OF PRESENTATION

Majority of patients had symptoms for sometimes tended to ignore them and presented at their late stages.

8 cases presented in this series as acute Emergencies (16%) as intestinal obstruction. Most of the Right sided tumors had symptoms of altered bowel habits, Anemia and lump abdomen. One case presented with mucus discharge.

Majority of bleeding per rectum was seen in rectum and sigmoid colon cancers. One patient presented late with enterovesical and enterocutaneous fistula.

Two patient of rectal carcinoma advanced stage presented with pain, 3 patients with secondaries liver.

Abdominal lump was present in most of right sided cancers and sigmoid growth and in one case of hepatic flexure growth.

5 patients present with symptoms of metastasis and disseminated disease.

DIAGNOSIS

Diagnosis in this study was not a problem because most patients presented at later stage right sided lesions presented mass carcinoma and left sided growth. Presented with mass or obstruction and most of rectal growth is palpated on per rectal examination.

PATHOLOGY AND STAGE

Most of the rectosigmoid and left sided growth were annular and ulceration with infiltration type. One sigmoid growth showed infiltration into bladder and overlying skin.

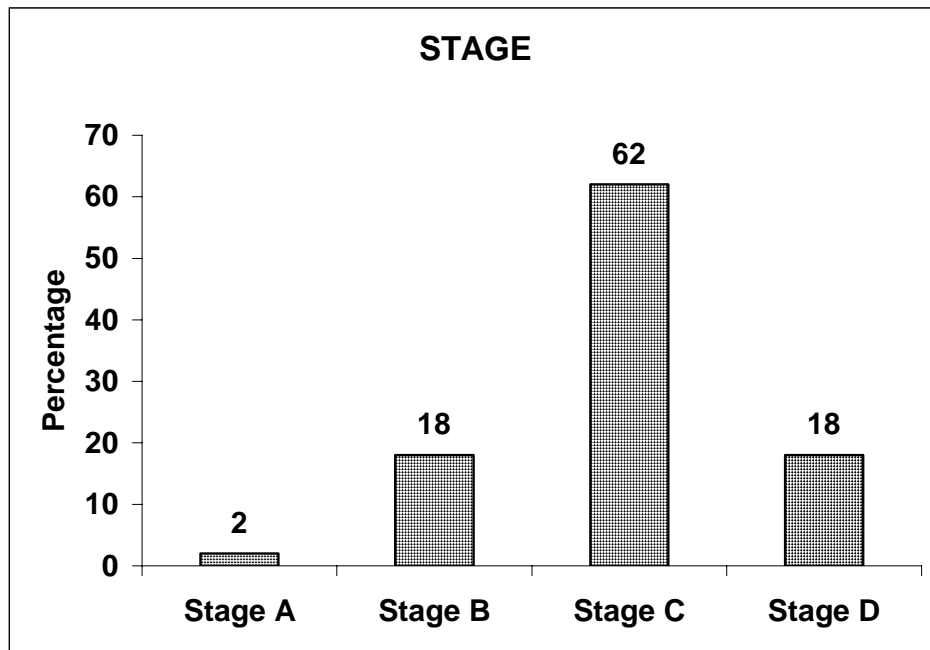
Majority of right sided growth were polypoidal or cauliflower like growth.

STAGING

Only one case presented in duke stage A, and 9 cases in stage B (18%) and 31 cases in stage C (62%) and 9 cases in stage D (18%).

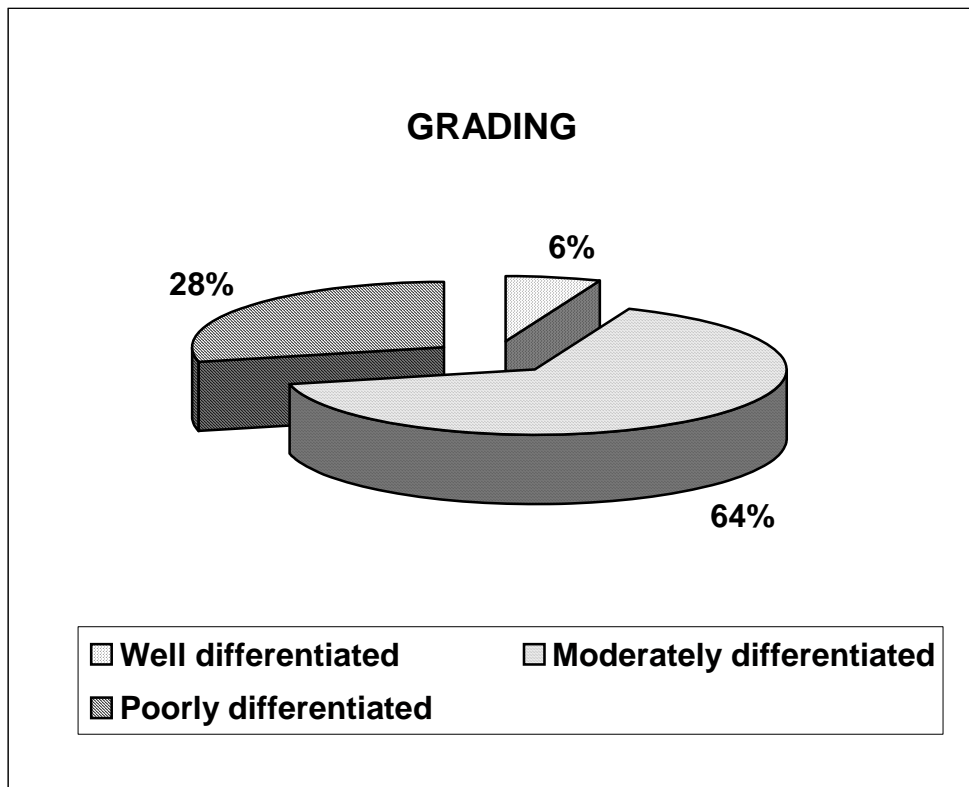
STAGE

Stage	No. of Cases	Percentage
Stage A	1	2%
Stage B	9	18%
Stage C	31	62%
Stage D	9	18%



GRADING

Grading	No. of Cases	Percentage
Well differentiated	3	6%
Moderately differentiated	32	64%
Poorly differentiated	14	28%



TREATMENT ADOPTED

Surgical resection is in the form of either curative, palliative (or) palliative bypass / colostomy was attempted on all patients.

EMERGENCY CASES

8 cases presented as acute abdominal emergencies. Among which 4 cases underwent Hartmann's procedure and temporary colostomy. 6 months later after assessing extent of the lesions and complete preparation. 3 cases undergone reanastomosis by stapler technique. 2 cases expired. 2 cases did not turn up for follow up.

ELECTIVE CASES

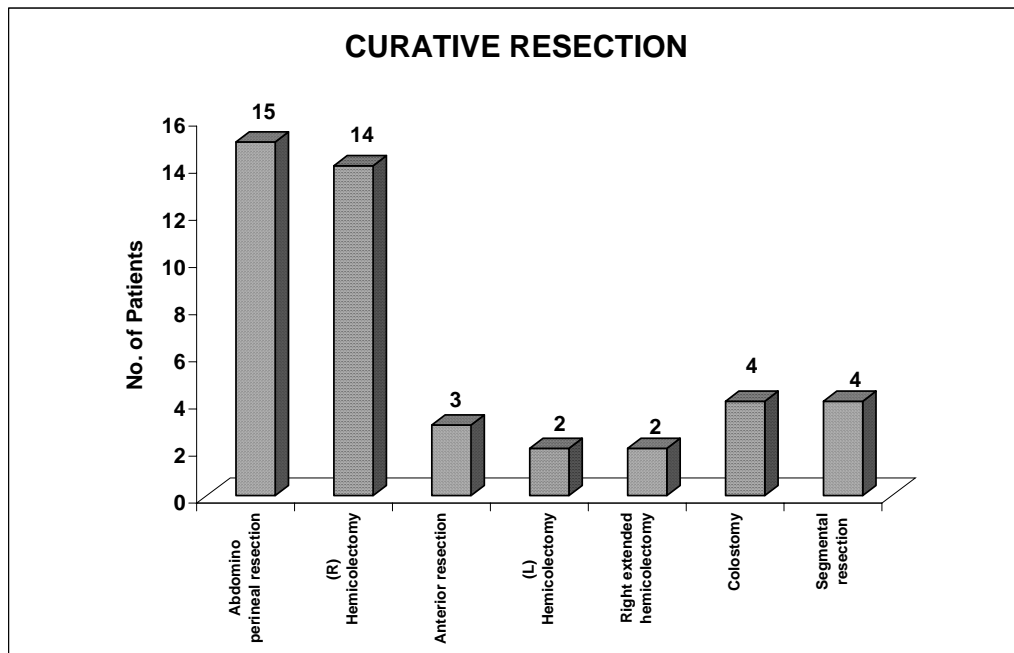
42 cases were treated with elective surgery in whom 15 rectal carcinoma underwent curative APR and 3 cases treated with anterior resection with coloanal anastomosis among which 1 case had undergone, hartman's procedure. 14 cases underwent right hemicolectomy, 2 cases underwent left hemicolectomy, 2 cases right extended hemicolectomy.

ADJUVANT THERAPY

Most cases are advised adjuvant chemotherapy normally 5 fluorouracil and calcium folinate. A minimum 6 cycles were given, with additional 4 cycles for partial response patients. Radiotherapy was given to one patient preoperatively and later underwent. Hartmann's, procedure.

CURATIVE RESECTION

Abdomino perineal resection	-	15
(R) Hemicolectomy	-	14
Anterior resection	-	3
(L) Hemicolectomy	-	2
Right extended hemicolectomy	-	2
Colostomy	-	4
Segmental resection	-	4



FOLLOW UP

30% of patient did not come for regular follow up. Two patient had recurrence, one in the abdominal wound and expired, other at the anastamotic site for which subtotal colectomy was done. 3 patient had local recurrence after APR surgery. 25 patient had regular follow up with repeat USG and colonoscope and basic investigation being normal.

CONCLUSION

- * Incidence of colorectal carcinoma is on the increase in the past few years.
- * There is no definitive evidence to say that diet rich in fat is risk factor.
- * Commonest age group of colorectal carcinoma was 5 - 6th decade, (middle age and elderly age).
- * The incidence was slightly higher in male M : F 1:5:1.
- * Ca rectum was most common site of large bowel in this study (46%).
There is also an increase incidence on the right side of colon (36%).
- * More patient presented to us with advanced stage considering bleeding PR and altered bowel habits as Haemorrhoids, as it is known by that only 2% of patient presented in Duckes Stage A.
- * 16% of patient presented with acute emergency in the form of intestinal obstruction.
- * Surgery is the main modality of treatment which is palliative or curative.
- * To conclude any patient of middle and elderly age group who presenting with bleeding PR and altered bowel habits should be investigated

thoroughly with per rectal, proctoscopic or sigmoidoscopic examination.

Patient presenting with advanced stage had poor prognosis.

- * Role of minimal access surgery in colorectal malignancy is vital as in upgrading stage, less morbid procedure, early recovery to work etc.
- * Hence patients must be educated about the symptom and etiology of colorectal malignancy and importance of screening in those with family history, in order to get a earlier treatment and better outcome for both the surgeon and patient alike.

MASTER CHART

TRANSANAL MICROSCOPIC ENDO SURGERY





BARIUM ENEMA - GROWTH ASCENDING COLON



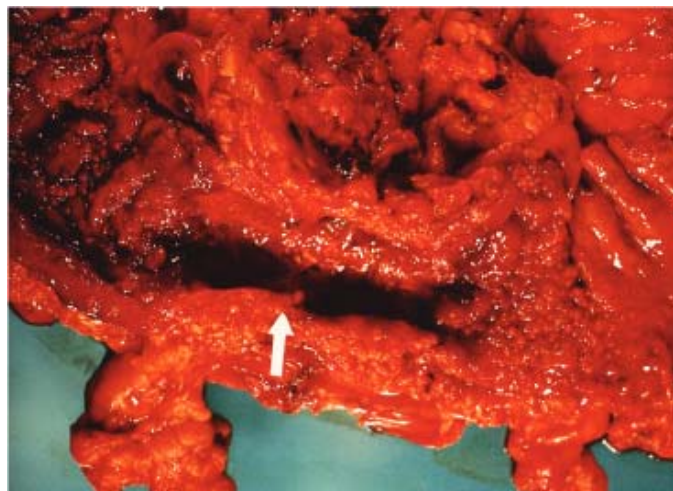
CT SCAN - GROWTH ASCENDING COLON



VILLOUS ADENOMA RECTUM



CARCINOMA COLON



ANNULAR GROWTH RECTUM



POSITION OF PATIENT FOR APR



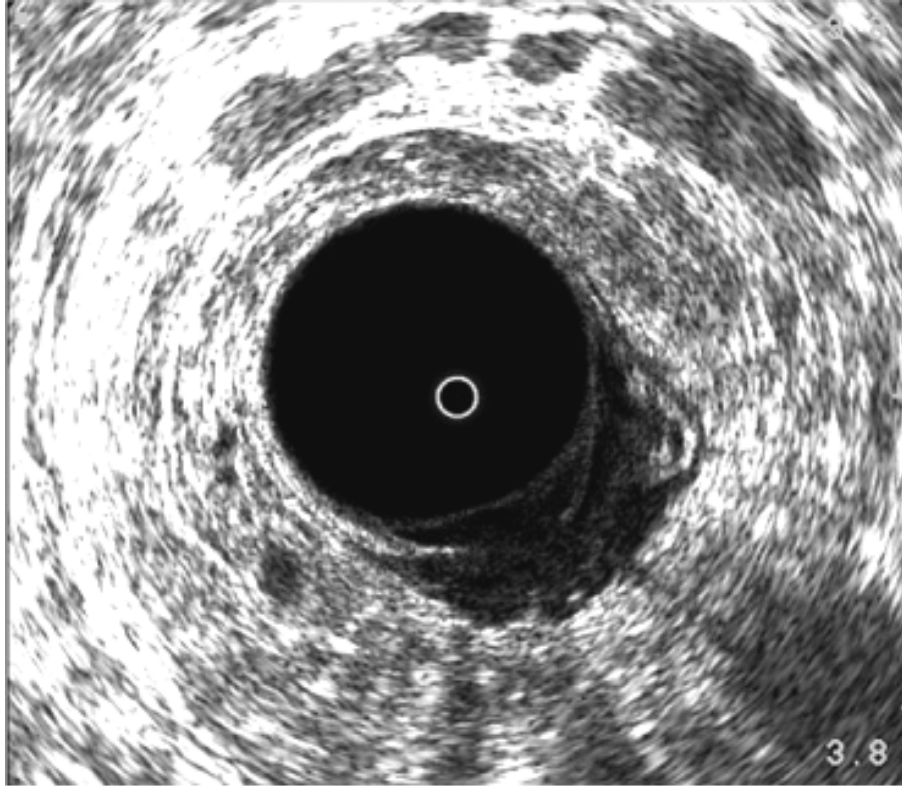
SIGMOID END COLOSTOMY



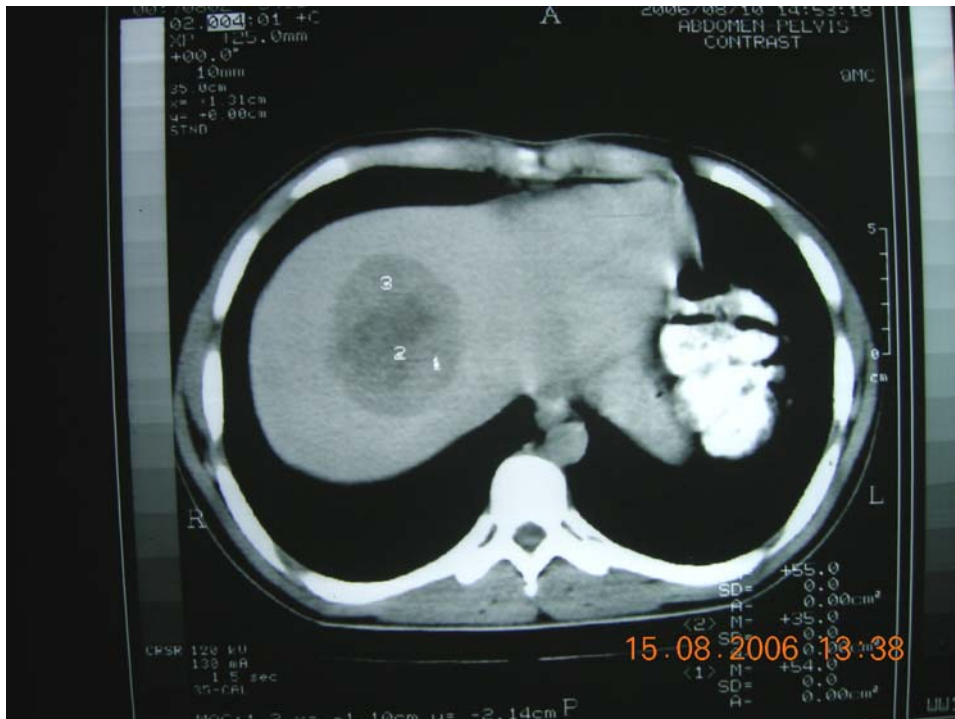
**HEPATIC FLEXURE GROWTH
RIGHT EXTENDED HEMICOLECTOMY**



ABDOMINAL PERINEAL RESECTION SPECIMEN

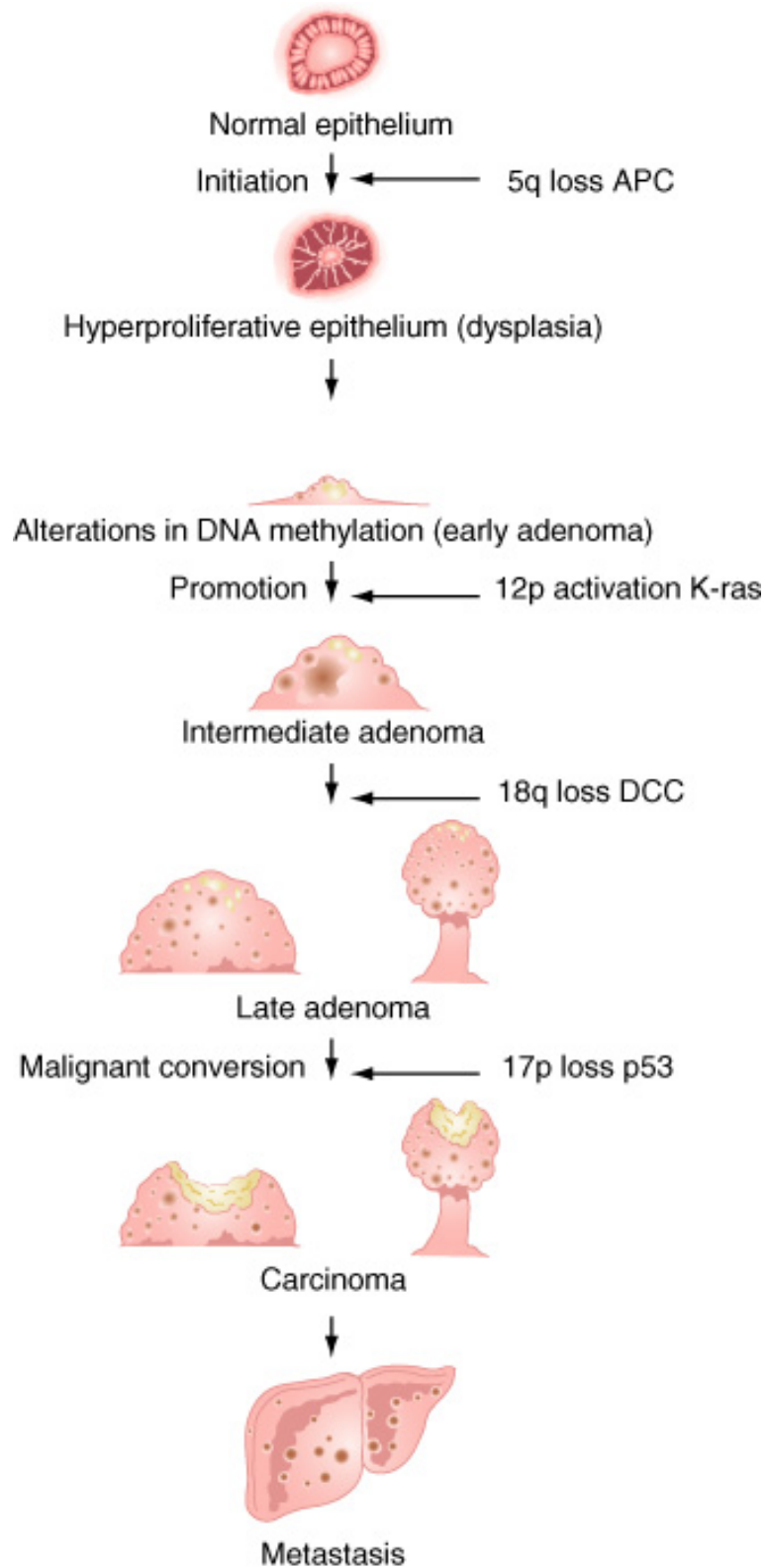


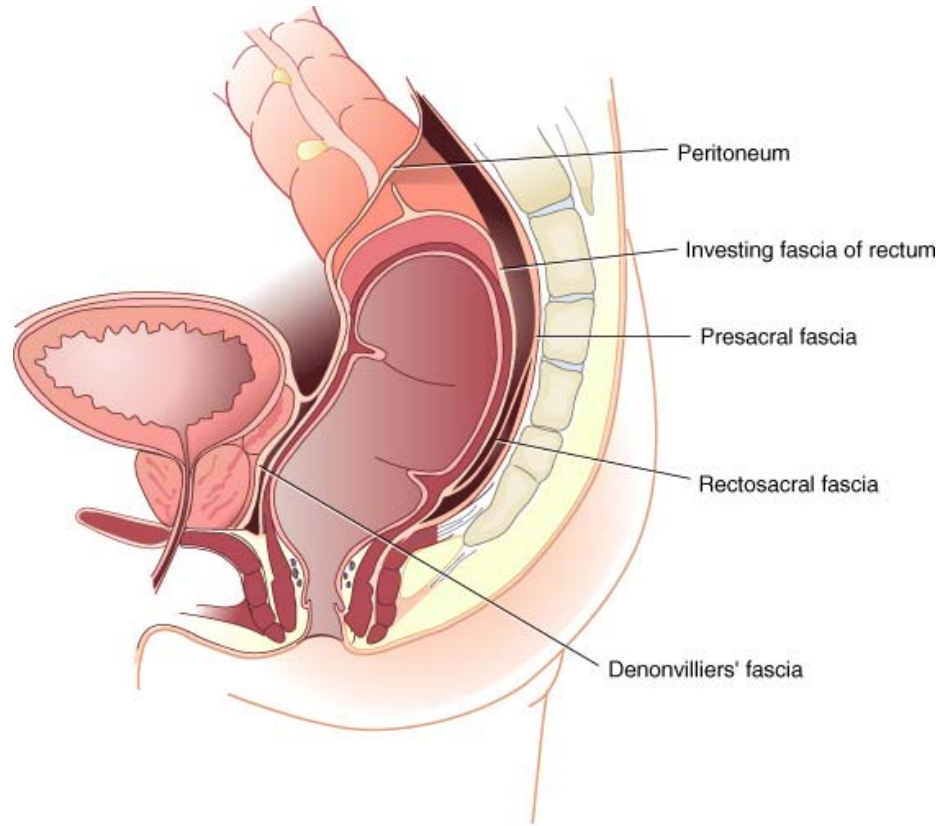
ENDORECTAL ULTRASOUND



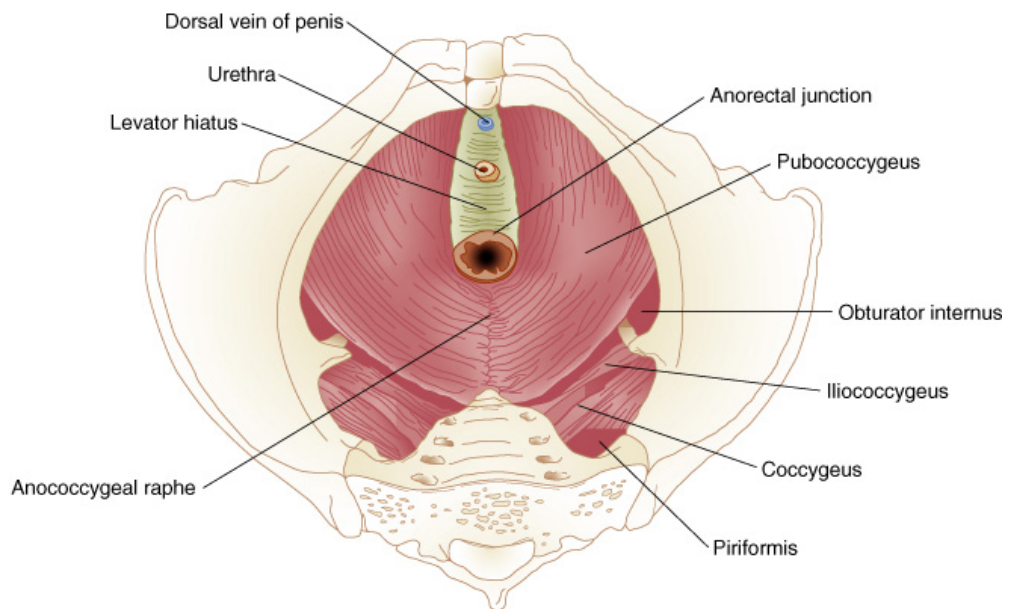
CARCINOMA RECTUM WITH LIVER SECONDARIES

GENETIC PATTERN OF INHERITANCE

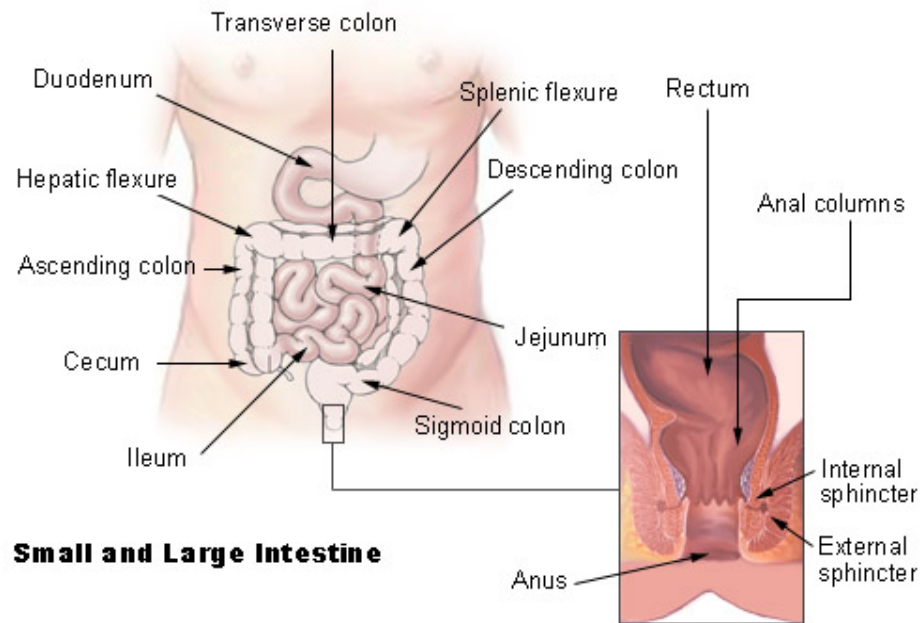




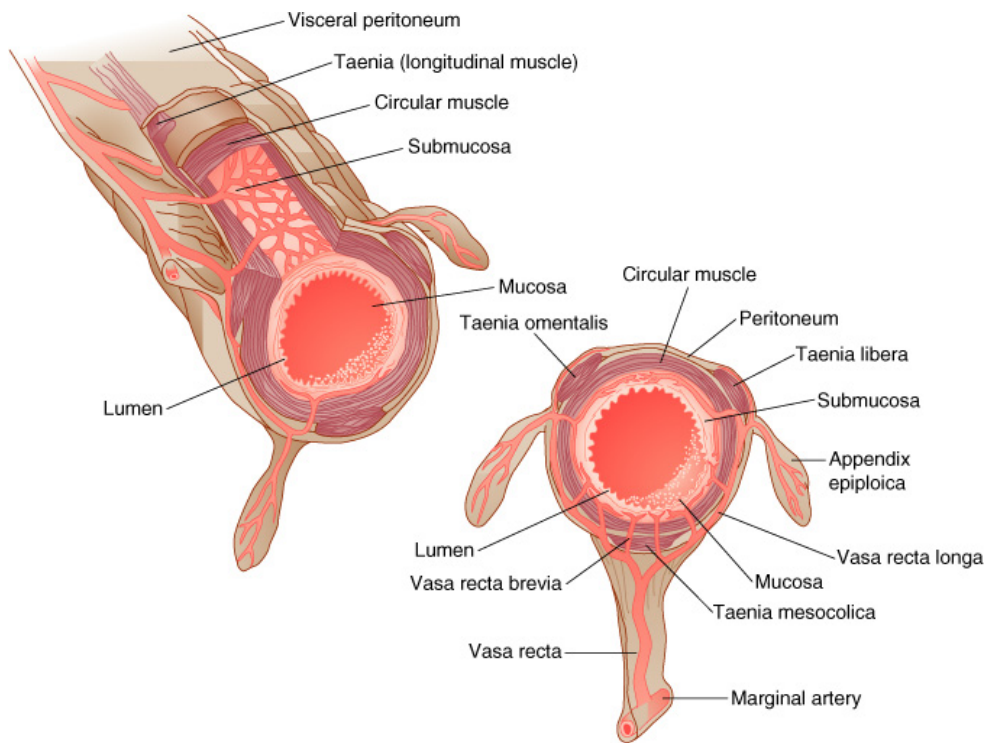
ANATOMY OF RECTUM



ANATOMY OF PELVIC FLOOR

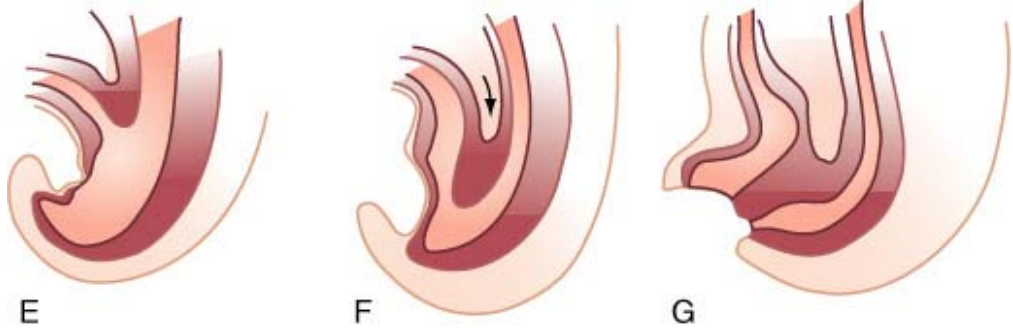
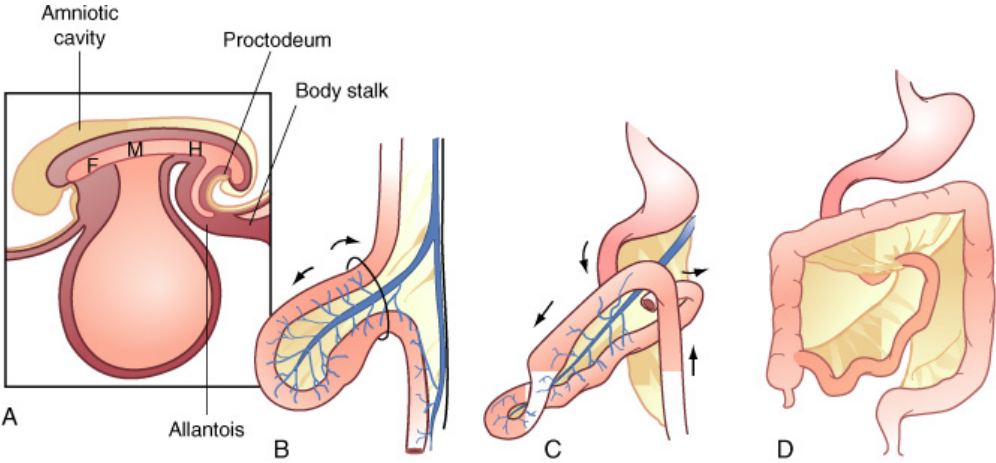


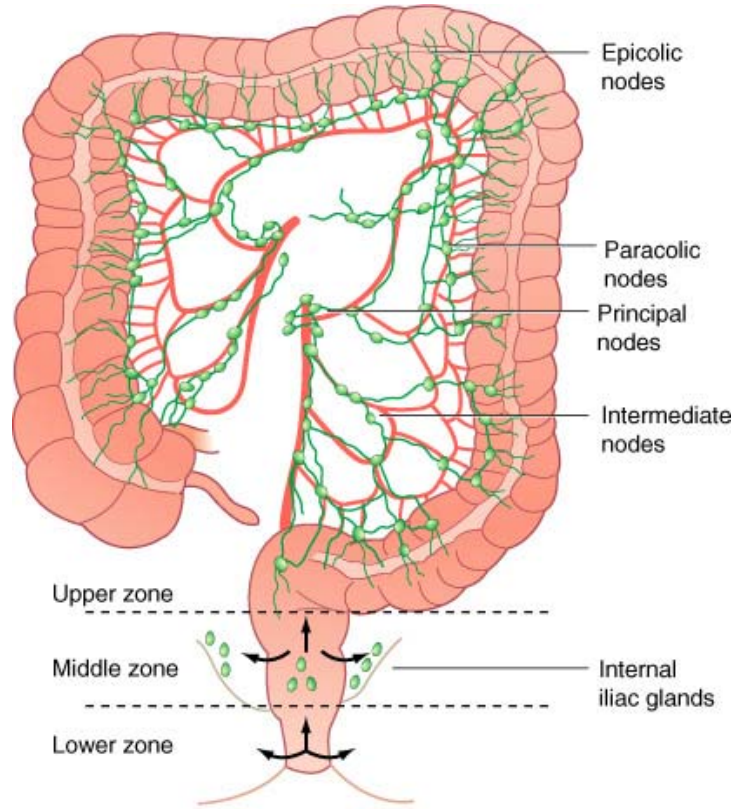
ANATOMY OF LARGE INTESTINE



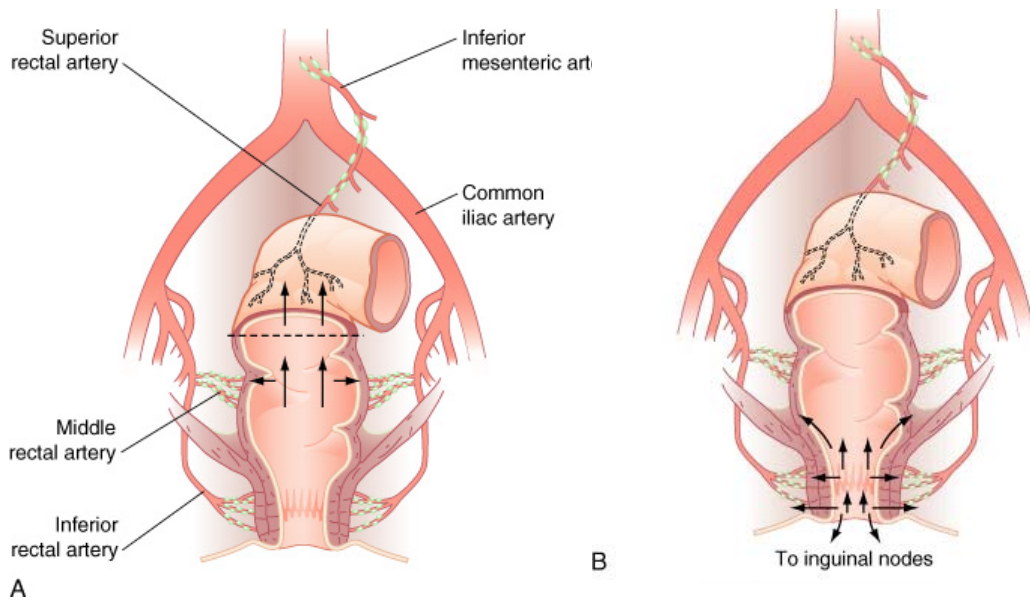
CROSS SECTION OF LARGE INTESTINE

EMBRYOLOGY

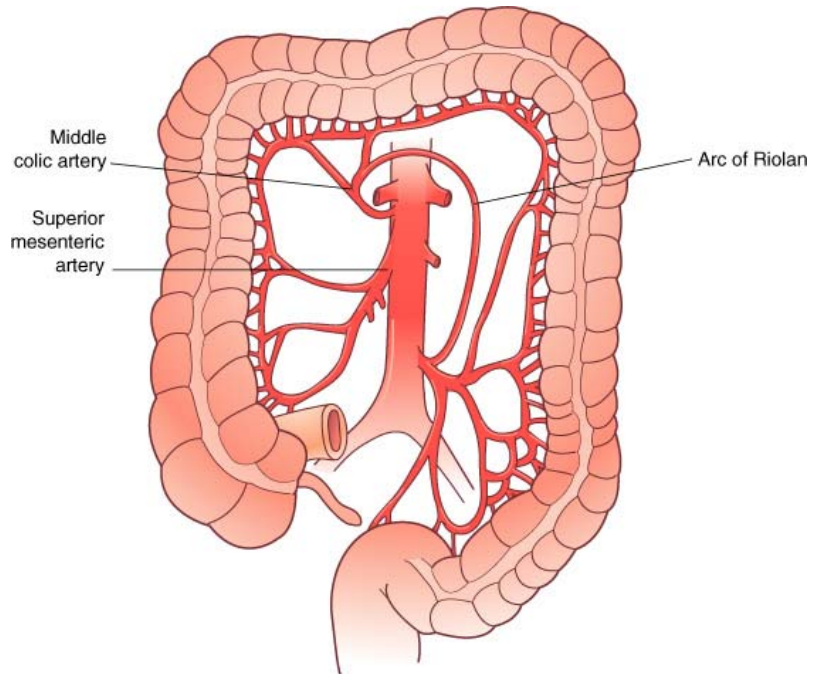




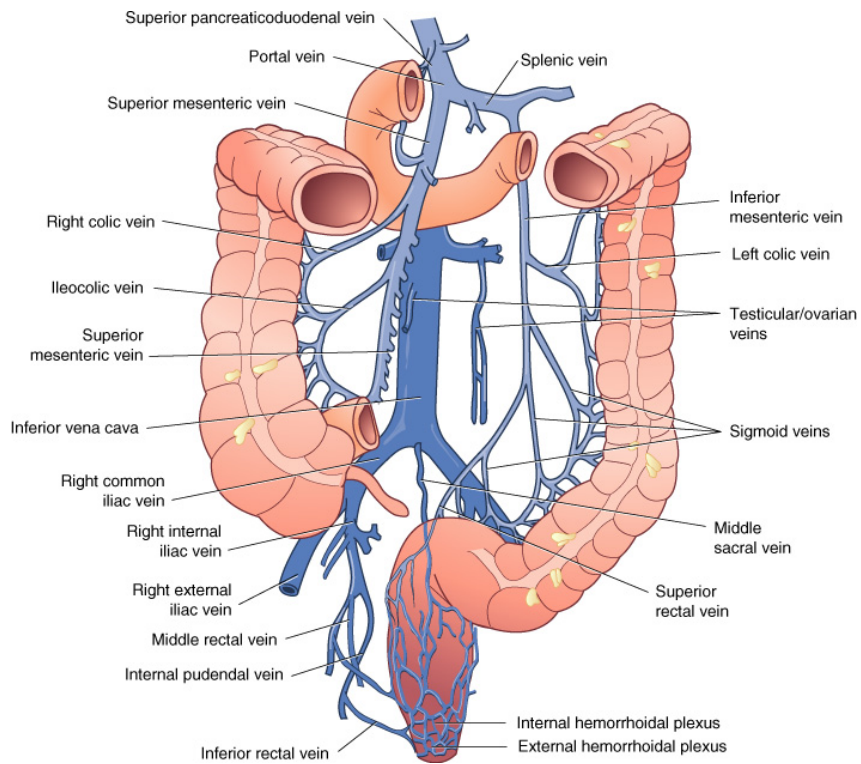
LYMPHATIC DRAINAGE OF LARGE INTESTINE



LYMPHATIC DRAINAGE OF RECTUM



ARTERIAL SUPPLY OF LARGE INTESTINE



VENOUS DRAINAGE OF LARGE INTESTINE

Sl.No	Name	Age	Sex	IP.No	Site of Tumor	Surgery	Stage
1.	Kasthuri	53	F	840076	Sigmoid	Segmental resection	B
2.	Rajathy	45	F	845232	Anorectal growth	-	D
3.	Thothathri	70	M	845550	Sigmoid	Segmental resection	B
4.	Pandian	48	M	851805	Rectum	Diversion colostomy	D
5.	Ganesan	55	M	849436	Ascending colon	Right hemicolectomy	B
6.	Elumalai	45	M	814777	Rectum	APR	C
7.	Jayaseelan	69	M	848674	Hepatic flexure	Extended Rt Hemicolectomy	C
8.	Rathinam	38	F	849198	Rectum	Low Anterior resection	B
9.	Thilagam	55	M	897653	Rectum	APR	C
10.	Andaiammal	45	F	814944	Rectum	Diversion colostomy	C
11.	Venkatesan	21	M	836674	Rectum Liver secondaries	-	D
12.	Babu	30	M	839941	Rectum	APR	C
13.	Jayakumar	39	M	839881	Rectum	APR	C
14.	Kuppuswamy	55	M	846144	Caecum	Rt hemicolectomy	B
15.	Kavitha	21	F	836178	Rectum	APR	C
16.	Ravi	42	M	827509	Ascending colon	Rt hemicolectomy	B
17.	Senthuran	72	M	822601	splenic flexure	Left hemicolectomy	C
18.	Balakrishnan	55	M	817911	Ascending colon	Rt hemicolectomy	C
19.	Gosh Mohdeen	23	M	816580	Rectum	APR	C
20.	Kullamma	50	F	815025	Sigmoid	Segmental resection	C
21.	Senthilkumar	50	F	812601	Ascending colon	Rt hemicolectomy	B
22.	Kamatchiammal	55	F	813764	Rectosigmoid	Anterior resection	C
23.	Shanthy	38	F	841743	Rectum with liver secondaries	-	D
24.	Raman	50	M	809876	Hepati flexure	Rt extended hemicolectomy	B
25.	Venkatachalam	40	M	804955	Caecum	Rt Hemicolectomy	C
26.	Pachaiammal	55	F	852441	Sigmoid, enterovesical, Enterocutaneous fistula	Defunctioning colostomy	D
27.	Gowri	55	F	848771	Rectum	APR	C
28.	Nallamma	50	F	814831	Ascending colon	Rt Hemicolectomy	C
29.	Dhanalakshmi	60	F	13538	Ascending colon	Rt Hemicolectomy	C
30.	Nagammal	76	M	18359	Caecum with Rt HUN	Ileotransverse anastomosis	D
31.	Damodaran	56	M	26542	Caecum	Loop colostomy	D

Sl.No	Name	Age	Sex	IP.No	Site of Tumor	Surgery	Stage
32.	Balaraman	52	M	26958	Rectum	APR	C
33.	Yesumani	46	F	2098	Ascending colon	Rt Hemicolectomy	C
34.	Sebastian	58	M	9312	Recto sigmoid	Anterior resection	C
35.	Krishnammal	49	F	814777	Caecum	Rt Hemicolectomy	C
36.	Vijaya	50	F	822601	Ascending colon	Rt Hemicolectomy	C
37.	Chandramangal lakshmi	58	F	803827	Rectum with secondaries liver	APR	C
38.	Saroja	60	F	802238	Sigmoid growth	Left hemicolectomy	C
39.	Venugopal	50	M	839970	Rectum	APR	C
40.	Jayaraman	55	M	848292	Rectum	APR	C
41.	Rajabunisha	30	F	834410	Rectum with peritonealmetastasis	-	D
42.	Subramani	80	F	828519	Ano rectum	-	D
43.	Randian	32	M	851025	Rectum	APR	C
44.	Srinivasan	40	M	814117	Rectal ulcer	APR	A
45.	Sulthan	28	M	814715	Sigmoid	Segmental resection	C
46.	Jothi	38	M	817550	Ascending colon	Rt hemicolectomy	C
47.	Mumtaj	45	F	833634	Rectum	APR	C
48.	Pandurangan	59	M	837319	Rectum	APR	C
49.	Ramachandran	62	M	816628	Ascending colon	Rt hemicolectomy	C
50.	Indrani	50	F	820752	Caecum	Rt hemicolectomy	B

Adeno - Adeno Carcinoma

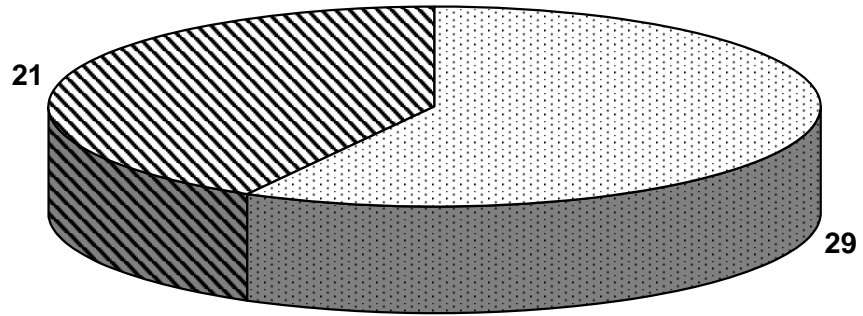
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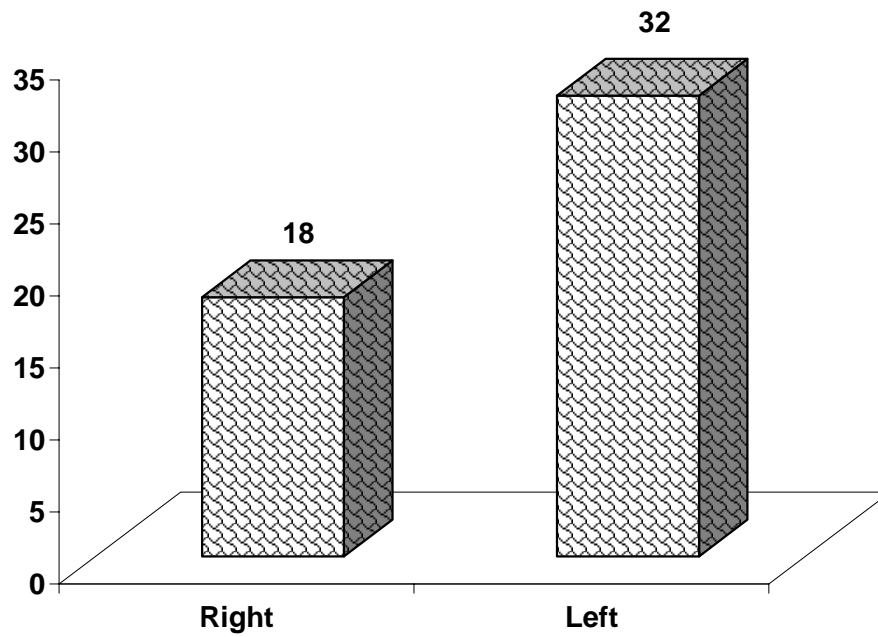
SEX INCIDENCE



Male

Female

SITE INCIDENCE



CURATIVE RESECTION

