A STUDY TO ANALYSE THE PRESENTATION ,TREATMENT , RISK FACTORS AND OUTCOME OF PATIENTS WITH OBSTRUCTIVE AND PERFORATIVE COLO –RECTAL CARCINOMA

Dissertation submitted to

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

With the fulfilment of the Regulations

For The Award of The Degree of

M.S. GENERAL SURGERY

(BRANCH -I)

APRIL 2015

DEPARTMENT OF GENERAL SURGERY

MADURAI MEDICAL COLLEGE

MADURAI - 625020

BONAFIDE CERTIFICATE

This is to certify that this dissertation **AN ANALYTICAL STUDY OF PRESENTATION , TREATMENT , RISK FACTORS AND OUTCOME OF PATIENTS WITH OBSTRUCTIVE AND PERFORATIVE COLORECTAL CARCINOMA** is a work done by **DR.S.CHARAN** ,under my guidance during the period 2012 - 2014.This has been submitted in partial fulfilment of the award of M.S Degree in General Surgery (Branch I) by The Tamilnadu DR.M.G.R Medical University ,Chennai 600032 .

Prof.Dr.A.SANKARAMAHALINGAM,MS

PROFESSOR AND UNIT CHIEF & HEAD OF THE DEPARTMENT
DEPARTMENT OF GENERAL SURGERY,

MADURAI MEDICAL COLLEGE, MADURAI -20

THE DEAN

MADURAI MEDICAL COLLEGE,MADURAI -20

DECLARATION

I , **Dr.S.CHARAN** solemnly declare that the dissertation titled "**AN ANALYTICAL STUDY OF PRESENTATION , TREATMENT , RISK FACTORS AND OUTCOME OF PATIENTS WITH OBSTRUCTIVE AND PERFORATIVE COLORECTAL CARCINOMA** " is a bonafide work done by me in the Department of General Surgery at Government Rajaji Hospital ,Madurai during the period of June 2012 to June 2014.

I also declare that this bonafide work or a part of this work was not submitted by me or any other for any award , degree and diploma to any University ,Board either in India or abroad .

The dissertation is submitted to The Tamilnadu Dr.M.G.R Medical University ,towards partial fulfilment of requirement for the award of **M.S DEGREE**

IN GENERAL SURGERY (BRANCH I)

Place: Yours truly,

Date :

DR.S. CHARAN

ACKNOWLEDGEMENT

My heartfelt thanks and sincere gratitude to my unit Chief and Head of The Deparment, **Prof.Dr.A.SANKARAMAHALINGAM , M.S** ,for his esteemed guidance , valuable suggestions and motivation throughout the study .

I would like to express my sincere and heartfelt thanks to my unit Assistant Professors , **Dr.P.GANESH ,M.S ,Dr.C.GANGALAKSHMI ,M.S , Dr.C.GANGA , M.S & Dr.ASHOK CHAKRAVARTHY ,M.S** for their help and guidance throughout this study .

I express my profound gratitude to The Dean ,

Prof .Dr. B.SANTHAKUMAR ,MD ,Madurai Medical College ,Madurai for permitting me to use the college and Department facilities for my study .

I owe thanks to my friends and fellow postgraduate colleagues for their constant help and encouragement .

I whole heartedly thank my parents for their support and blessings .Last but not least , I am profoundly grateful to all patients for their co-operation and participation in the study .

TABLE OF CONTENTS

INTRODUCTION

Colo – rectal cancers (CRC) are the 3rd most cause of cancer death in developed countries .One third of the cancers are in rectum and two thirds are in the colon .Burden of the disease is similar in both men and women .

Acute presentation of CRC Is more common. Can present as either acute

Intestinal obstruction , perforative peritonitis or both. Screening by colonoscopy helps in diagnosing and staging the cancer before complications develop .

Prognosis is poor in patients presenting as complicated colo – rectal cancers.

AIM OF STUDY

AIM OF THE STUDY :

1. TO ANALYSE THE PRESENTATION , TREATMENT AND OUTCOME OF PATIENTS WITH COMPLICATED COLO-RECTAL CANCER (OBSTRUCTION/PERFORATION).

2.TO EVALUATE THE RISK FACTORS FOR MORBIDITY AND MORTALITY .

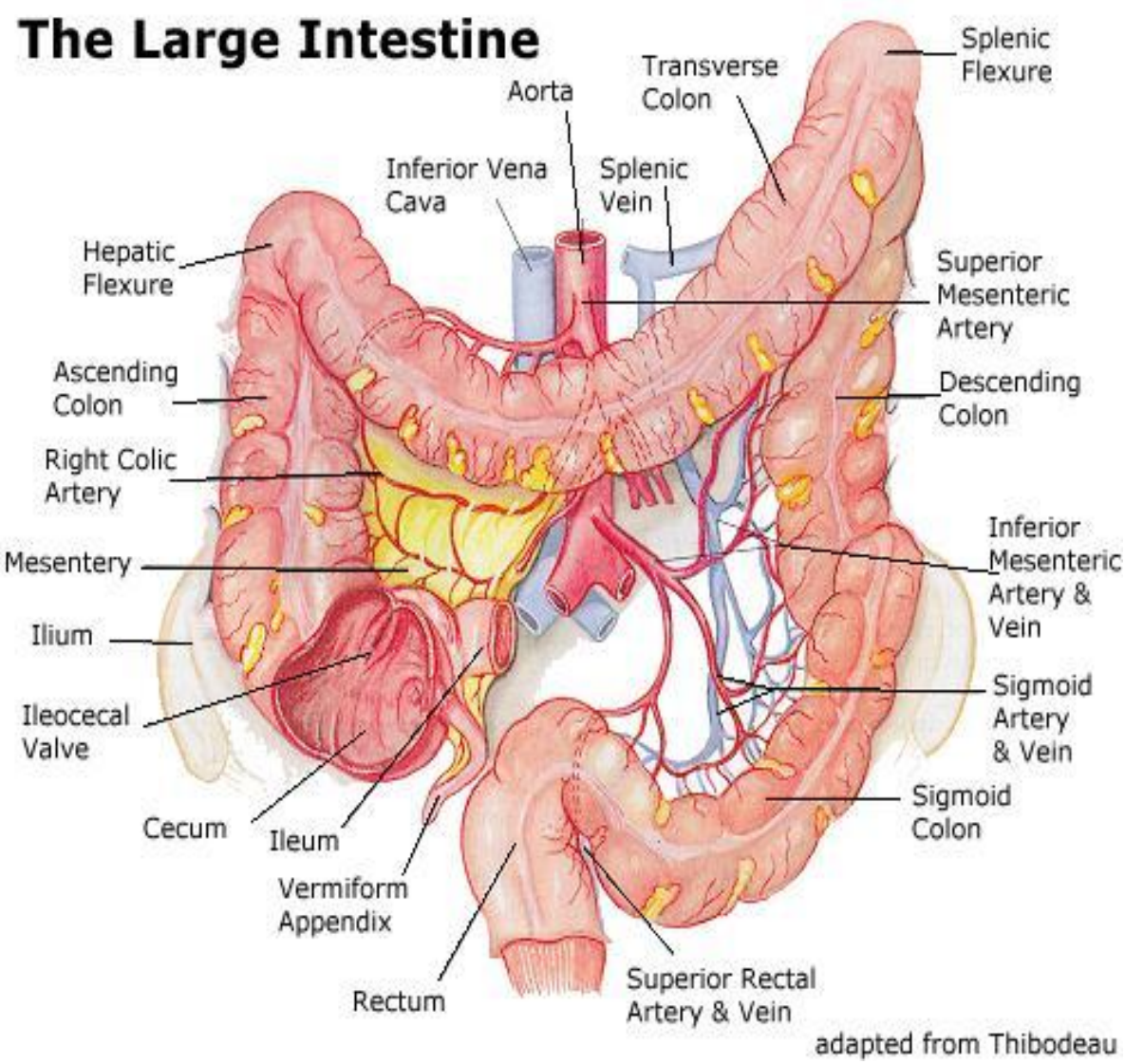
REVIEW OF LITERATURE

Macroscopic anatomy of colon and rectum

The colon starts from ileocaecal junction upto rectosigmoid junction .

Length of colon – ranges 120 to 200 cm.

Calibre - greatest near caecum and gradually reduces near sigmoid colon



EXTERNAL CHARACTERISTICS OF COLON :

1. Appendices Epiploicae

2. Taeniae coli

anterior taenia, or taenia libera

posterior taenia, or taenia omental

lateral taenia, or taenia mesocolica

3. Haustra of colon – absent in caecum.

relatively sparse – ascending & proximal ,tranverse colon.

more in – from middle of Transverse colon to distal colon

sigmoid – marked by sacculations.

INTERNAL CHARACTERISTICS OF COLON :

Caecum – trefoil pattern.

Ascending colon – shallow & loop haustration.

Transverse colon – triangular appearance

Descending Colon - cross section circular

DEVELOPMENT OF COLON :

Primitive gut tube develops from roof of yolk sac

Beginning by 3rd wk , gut tube divides into foregut, midgut & hindgut

Development takes place in 3 stages –

* physiological herniation (6th wk)

* return to abdomen (10th wk) after undergoing rotation through'

270 degree counter clockwise rotation around SMA pedicle

* fixation to posterior abdominal wall

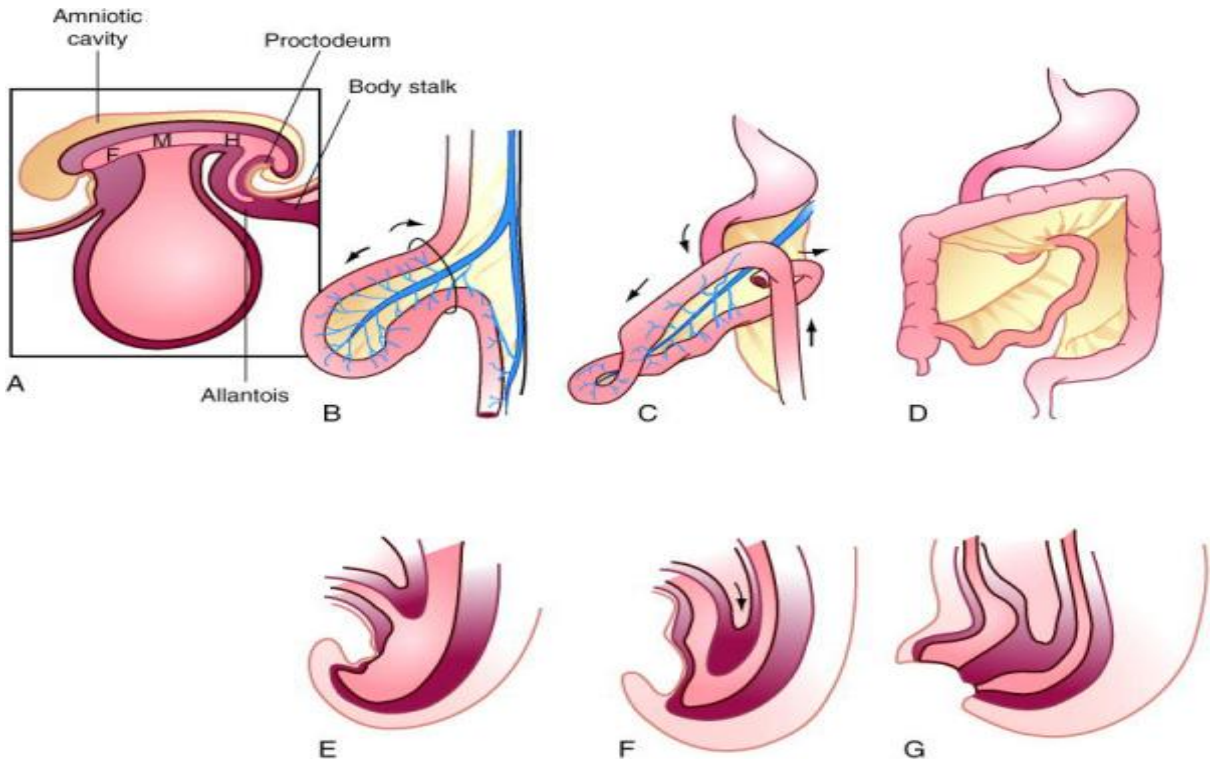
COLON

MID GUT DERIVATIVES :

- 1. Caecum and Appendix
- 2. Ascending colon
- 3. Right 2/3 of transverse colon

HIND GUT :

- 1. Left 1/3 of transverse colon
- 2. Descending and Pelvic colon



MICRO STRUCTURE OF COLON :

5 layers

1.Mucosa – lined by columnar epithelium; interspersed with goblet cells;

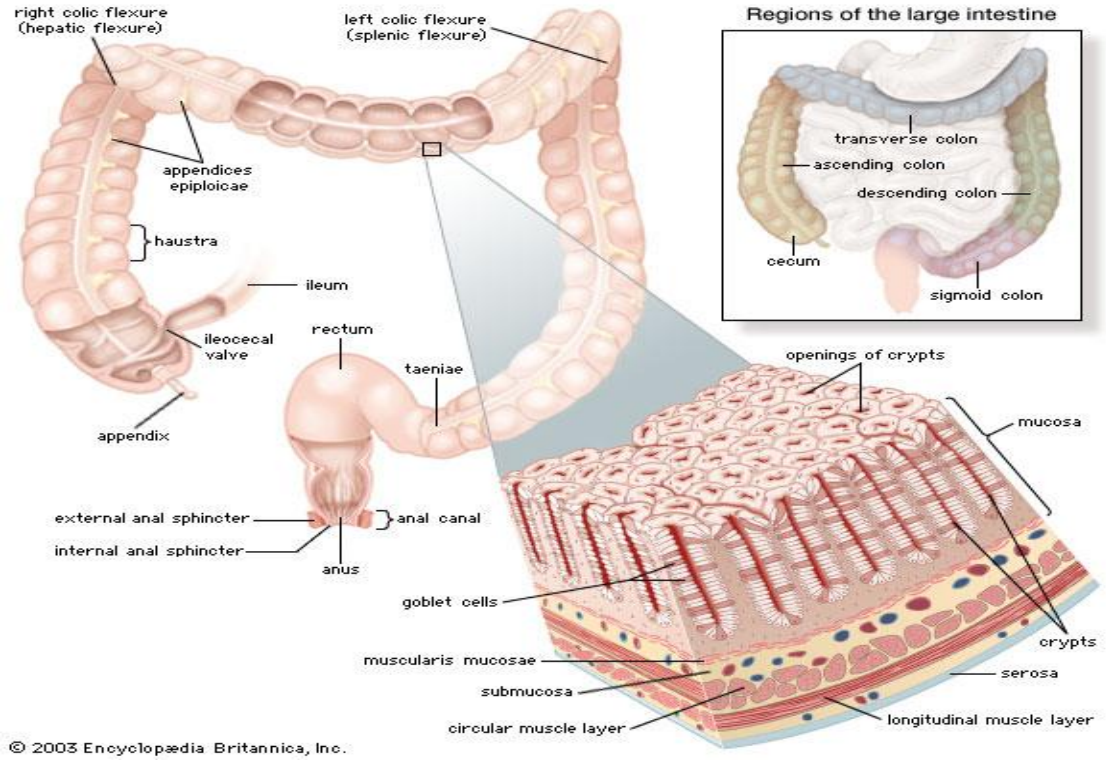
No villi

2 . Submucosa

3. Inner circular muscle layer

4. Outer longitudinal muscle layer

5. Serosa



CAECUM :

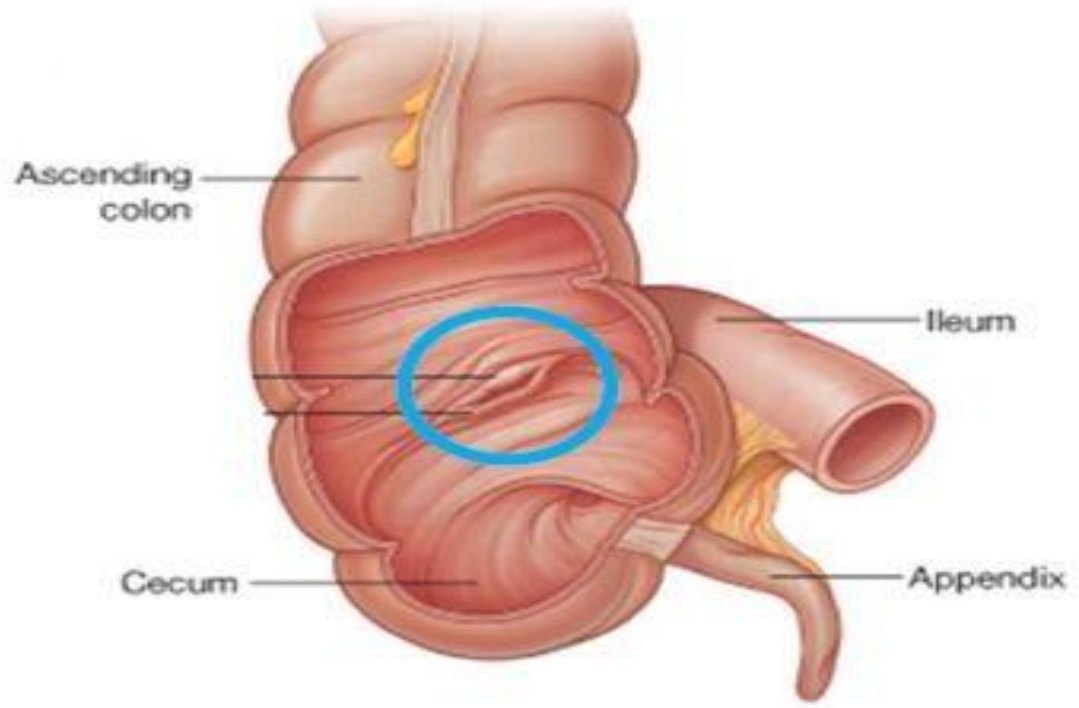
10 cm length; 7.5 cm diameter (4 × 3 “)

Widest diameter with thinnest muscular wall.

Completely enveloped by visceral peritoneum , mobile and has no mesentry.

Most vulnerable to perforation & least vulnerable to obstruction

Acute dilatation of > 12 cm (seen in X-ray abdomen) can result in ischaemic necrosis & perforation of bowel wall



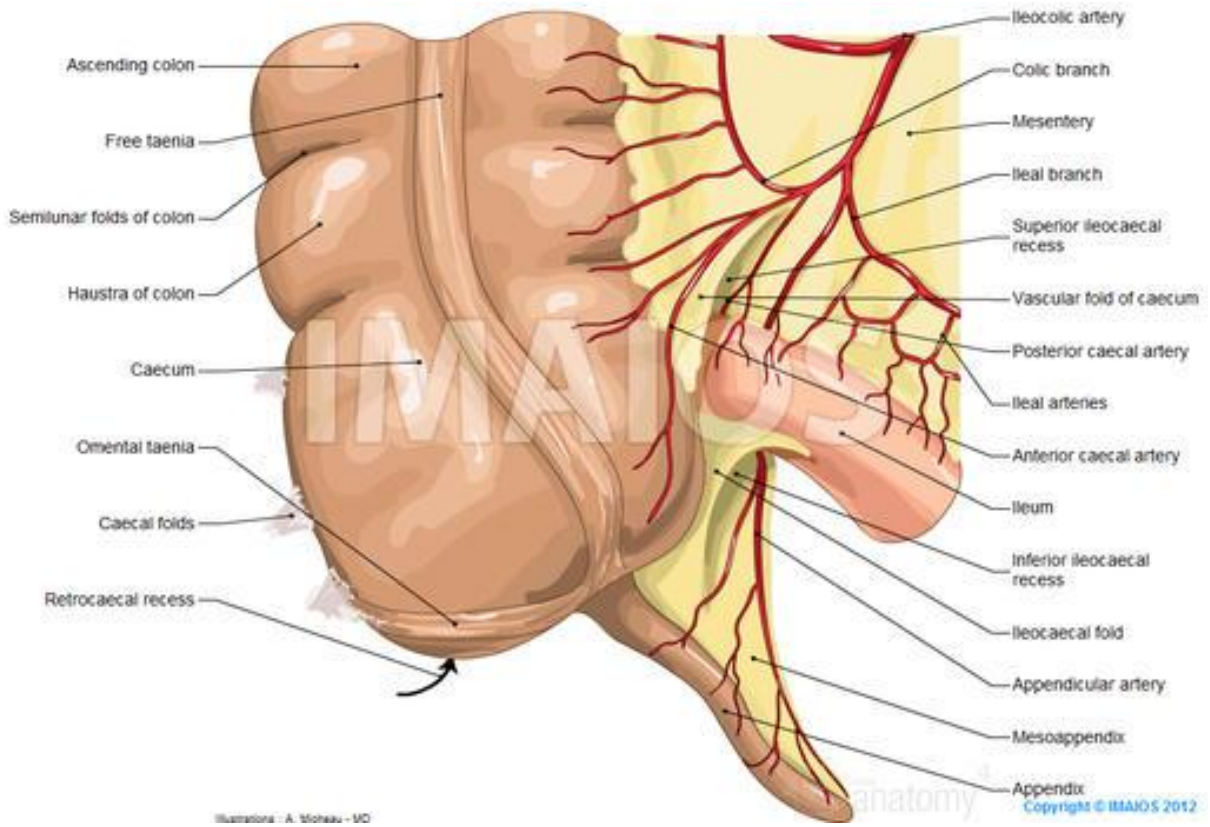
APPENDIX :

Takes origin from the postero -medial border of the caecum and can be located by following the anterior taenia to its junction with the other two taeniae

Its size is variable, 5 to 10 mm in diameter and 8 to 10 cm in length.

Common position - retro-caecal

Mesoappendix – appendicular artery and vein

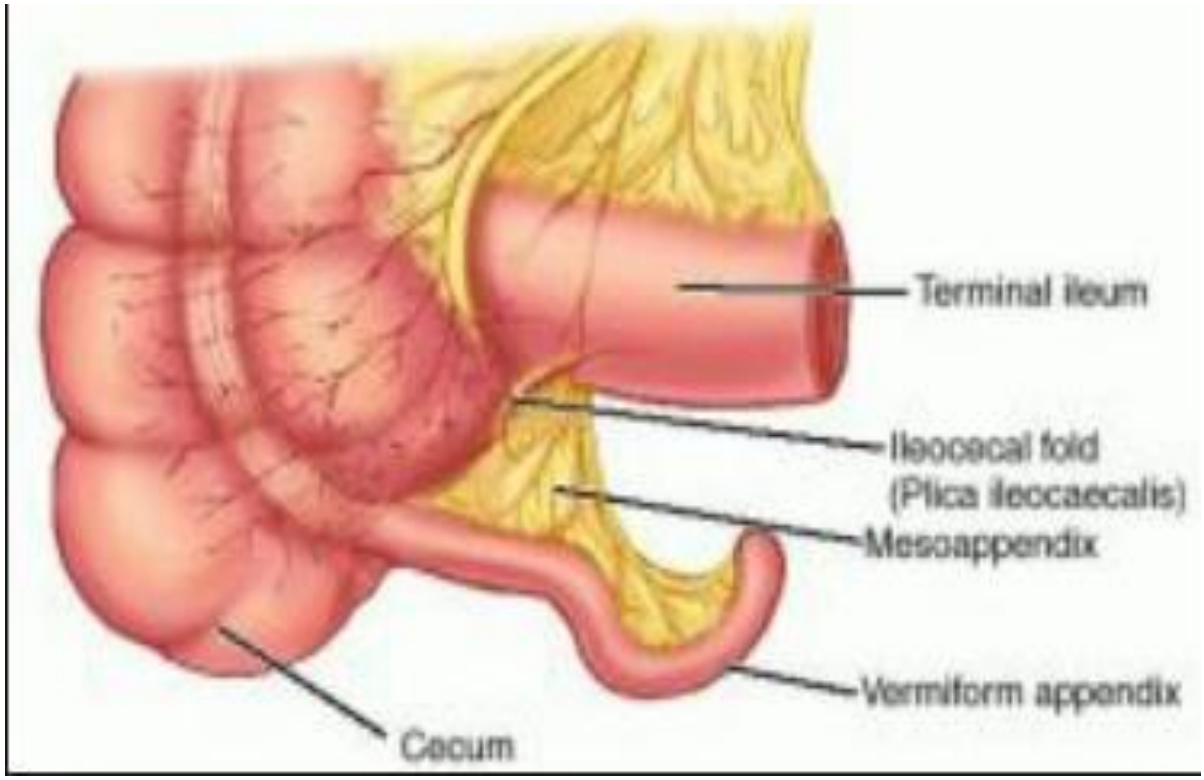


CAECUM AND APPENDIX :

The appendix is involved in the formation of several recesses in association with the caecum

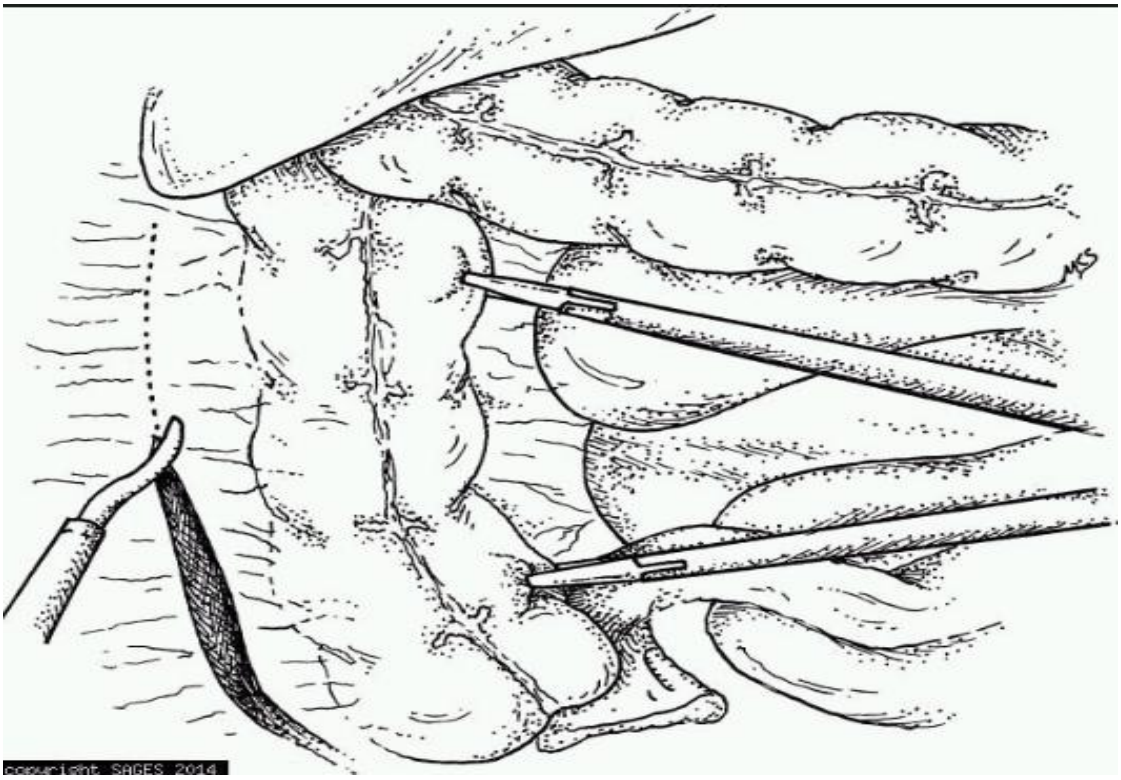
- superior ile-o caecal recess(FOSSA OF LUSCHKA)

-inferior ileo-caecal recess (BLOODLESS FIELD OF TREVES)



ASCENDING COLON :

- 15 cm length
- Starts from caecum and ends at hepatic flexure
- Postr surface fixed to retro peritoneum
- Lat & antr surfaces are true intra peritoneal structures
- White line of TOLDT
- Relations – Antr – Ant Abd wall, Coils of SI; Postr – Iliacus, TA aponeuroses, Lower pole of rt kidney & branches from lumbar plexus



TRANSVERSE COLON :

Mobile structure fixed in b/w hepatic & splenic flexures

Completely invested by visceral peritoneum

Tr. Mesocolon is a double fold of peritoneum suspending Tr. Colon from antr border of pancreas; content -MCA

Hepatic flexure lies anterior to rt. Kidney, duodenum & porta hepatis & postr to rt lobe of liver

Splenic flexure is at a higher level, more acutely angled & deeply situated than Hepatic Flexure – suspended by phrenico colic ligament.

DESCENDING COLON :

25 cm length

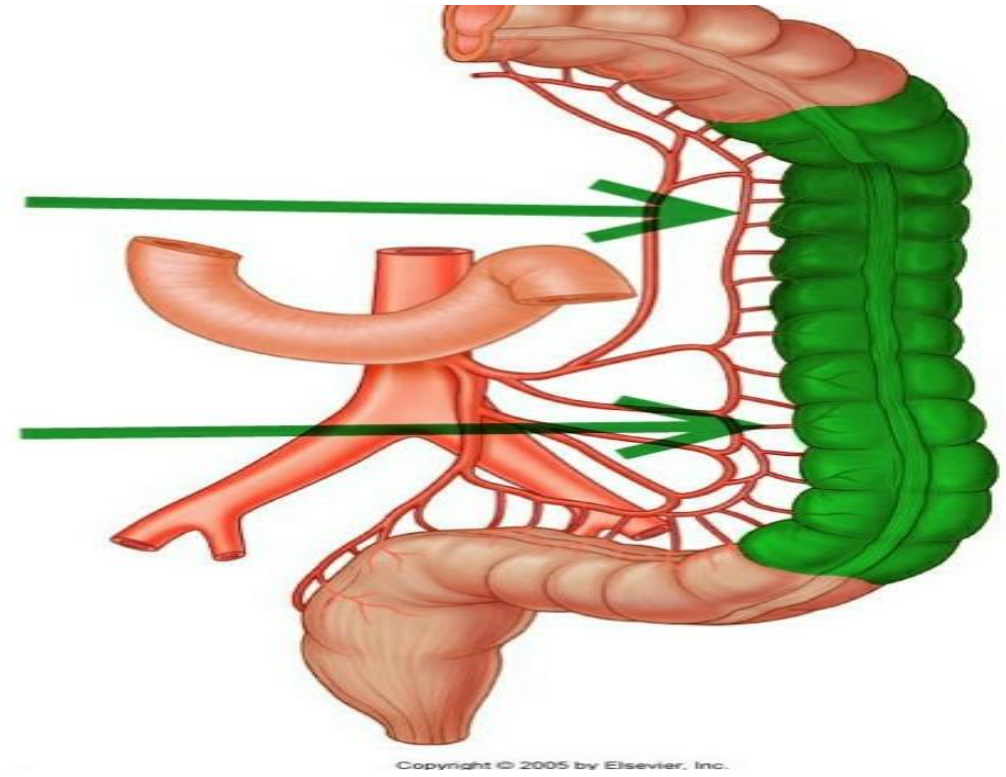
Anterior to left kidney

Starts from SF and ends at Sigmoid colon at level of pelvic brim

Thin walled and fixed to retroperitoneum

Relations – antr – T colon, AAw, coils of SI

Postrly – L kidney, branches of Lumbar plexus, T abdominis, Iliacus



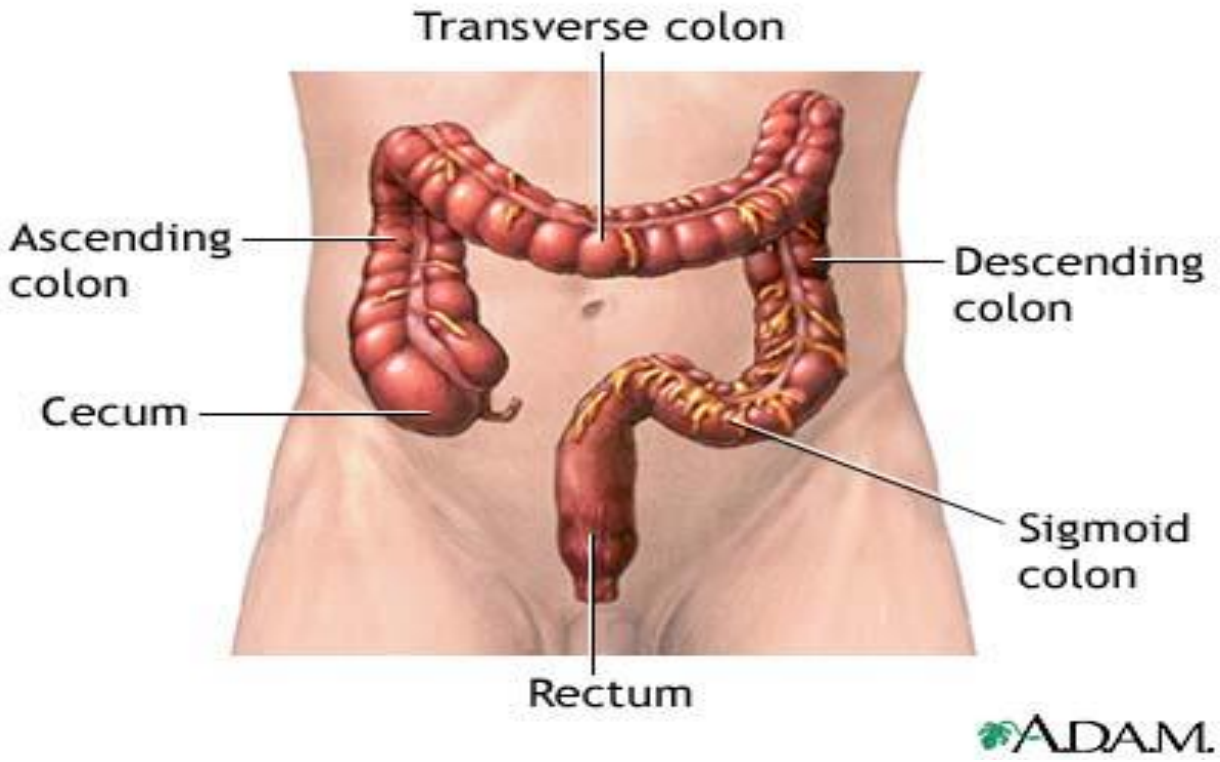
SIGMOID COLON :

Variable length 15 – 50 cm (avg 38 cm)

Long , floppy mesentry – hence more prone for volvulus

Pelvic mesocolon - ^ shaped – apex is the landmark for underlying left ureter; left limb attached to pelvic brim; rt limb extends from apex down to S3; content – superior rectal vessels

posteriorly - the left external and internal iliac vessels, the left gonadal vessels, the left ureter, and the roots of the sacral plexus

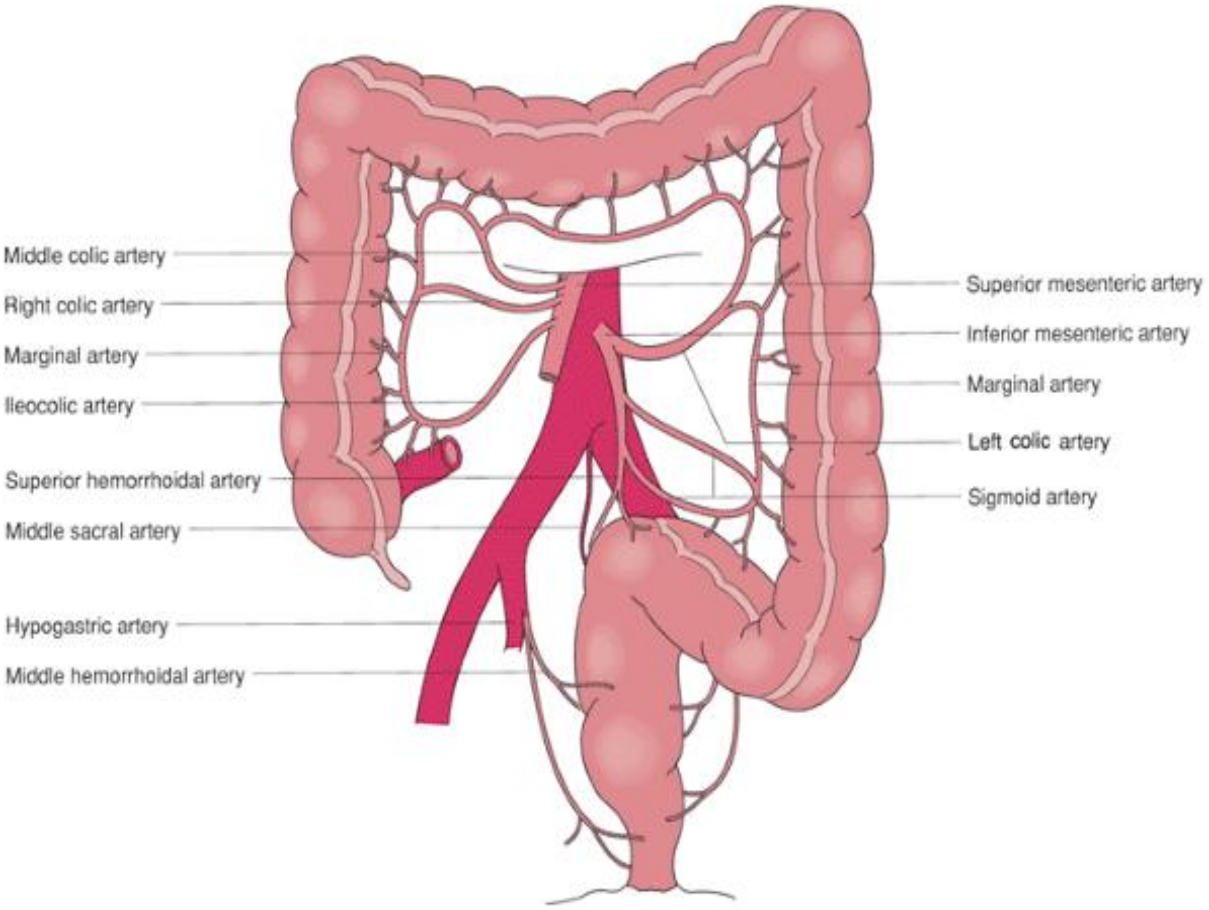


ARTERIAL SUPPLY :

Caecum, Appendix, Ascending colon and Right 2/3 of the transverse Colon

Supplied by colic branches of the superior mesenteric artery;

Left part of the transverse, descending and sigmoid colon, rectum and upper anal canal) are supplied by the inferior mesenteric artery.

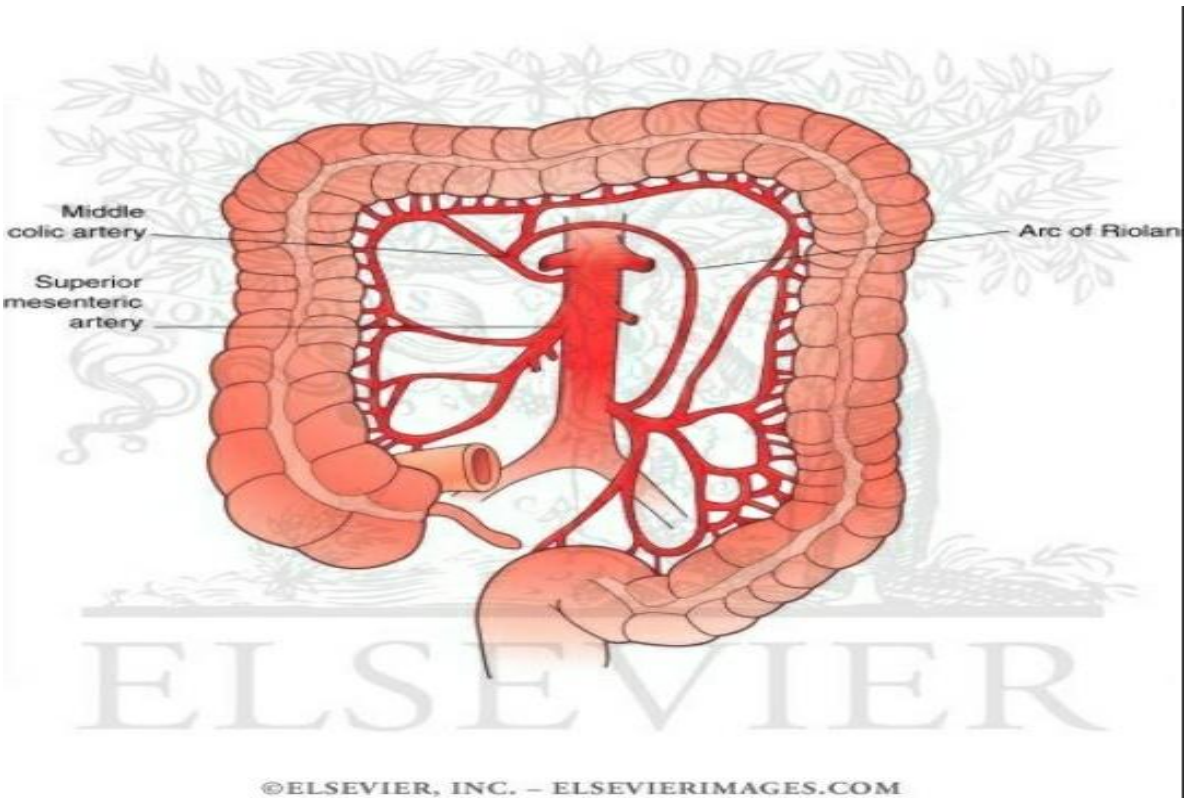


VASCULAR SUPPLY OF COLON :

- **POINTS TO REMEMBER:**
- Middle colic artery – surgical land mark for colon resection.
- **GRIFFITH' POINT** – "water shed " area at splenic flexure formed between left br. Of middle colic and ascending br. Left colic artery.
- **SUDECK POINT** – "water shed" area at rectosigmoid junction formed between sigmoid and superior rectal artery.

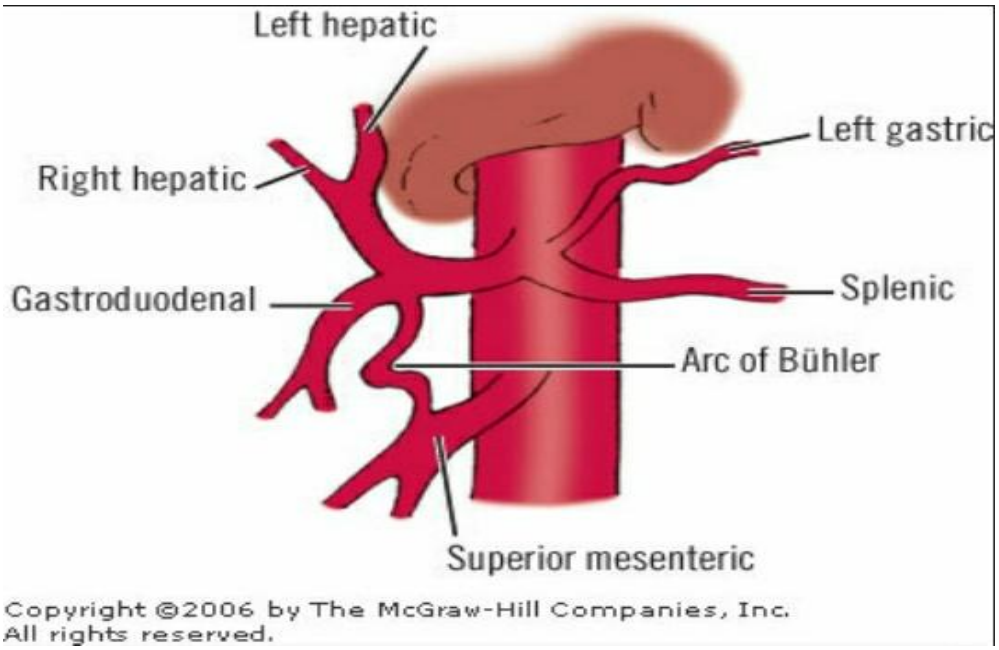
- **ARC OF RIOLAN.**

Inconstant artery connects proximal or its br of SMA and proximal or its br of IMA.



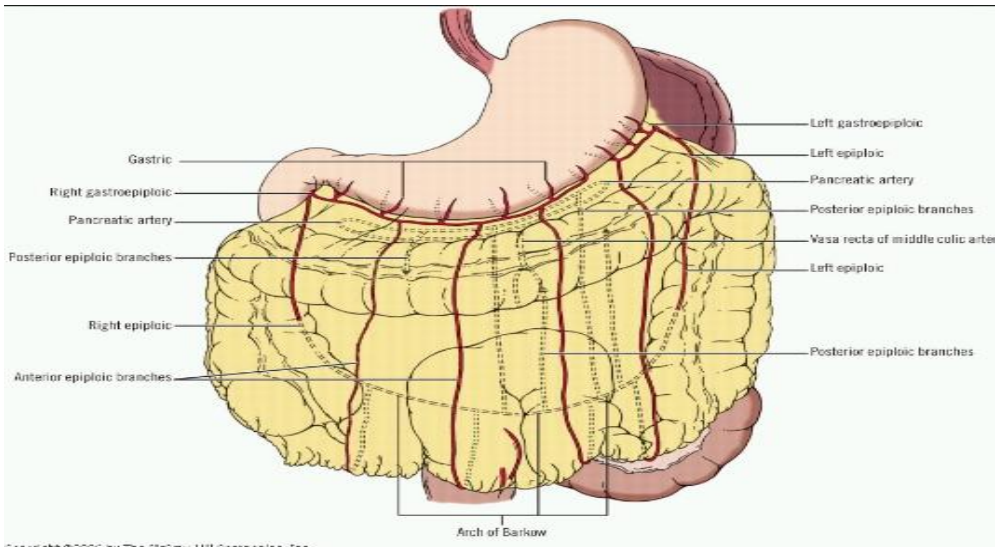
ARC OF BUHLER.

Embryological connection between COELIAC artery and SMA.



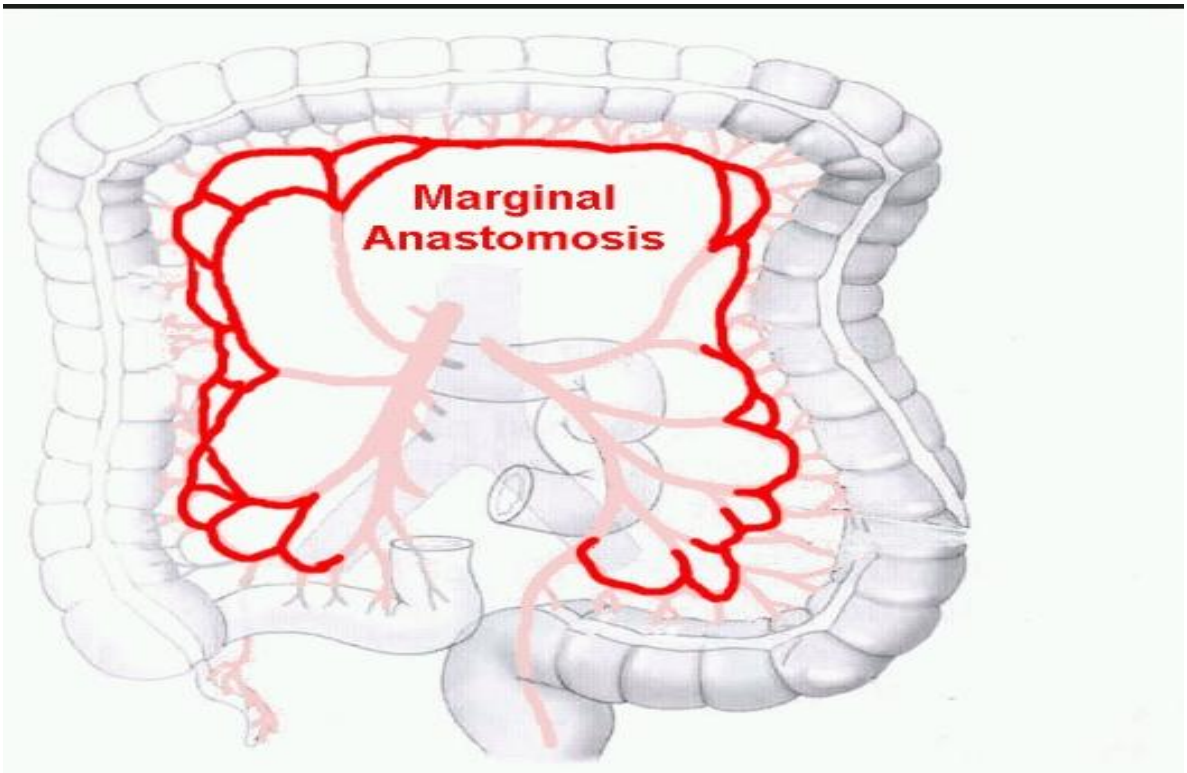
ARC OF BARKOW.

Formed by anastomosis of Branch Of GASTRODUODENAL artery and Branch Of SPLENIC artery.



Marginal artery of Drummond

ascending branch of the ileocolic artery;	the descending and ascending branches of the right colic artery;	the right and left branches of the middle colic artery;	the ascending, descending, and sigmoid branches of the left colic artery;.	the sigmoid branches of the inferior mesenteric artery; and the superior rectal artery

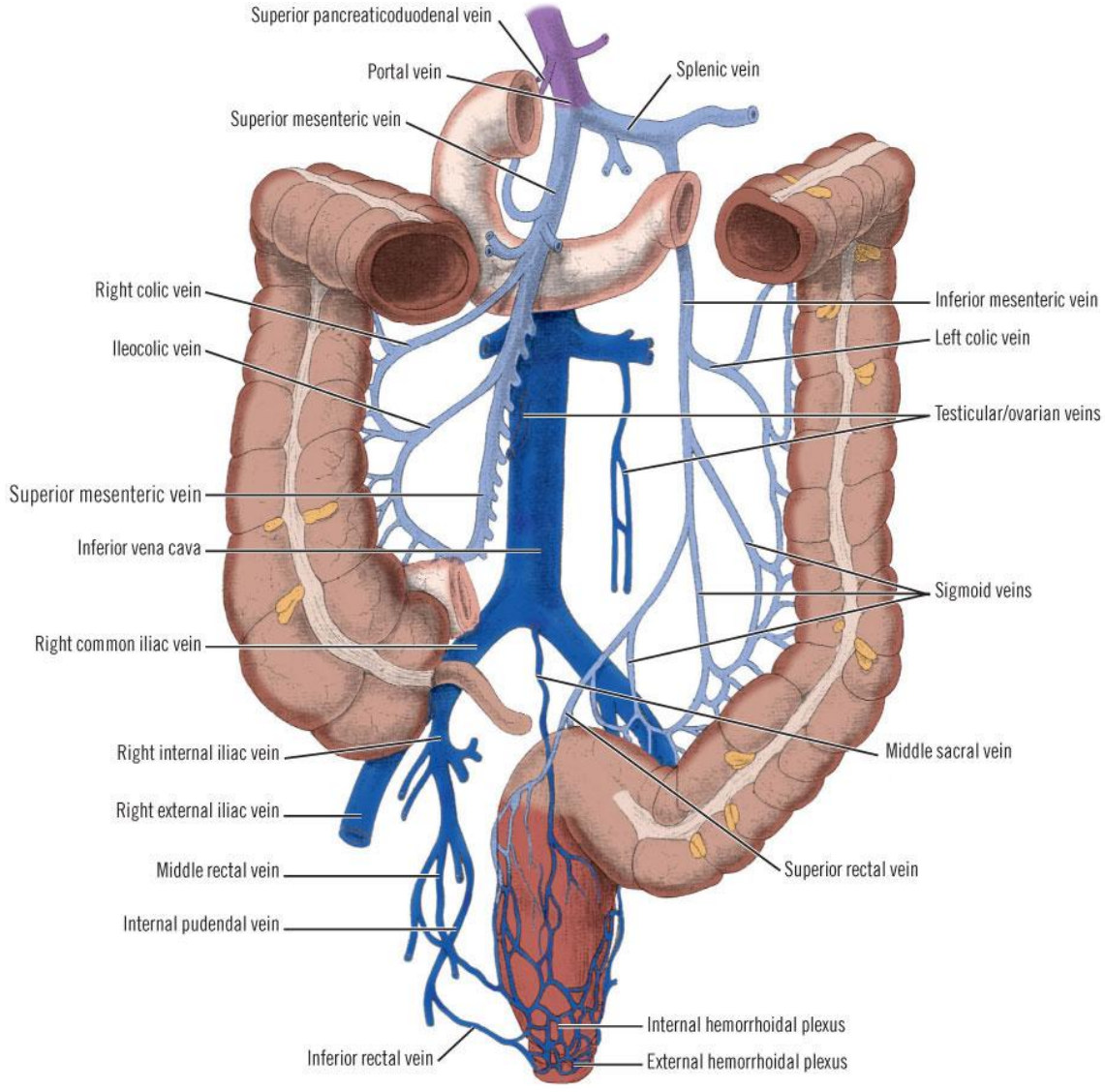


MARGINAL ARTERY OF DRUMMOND

Veins :

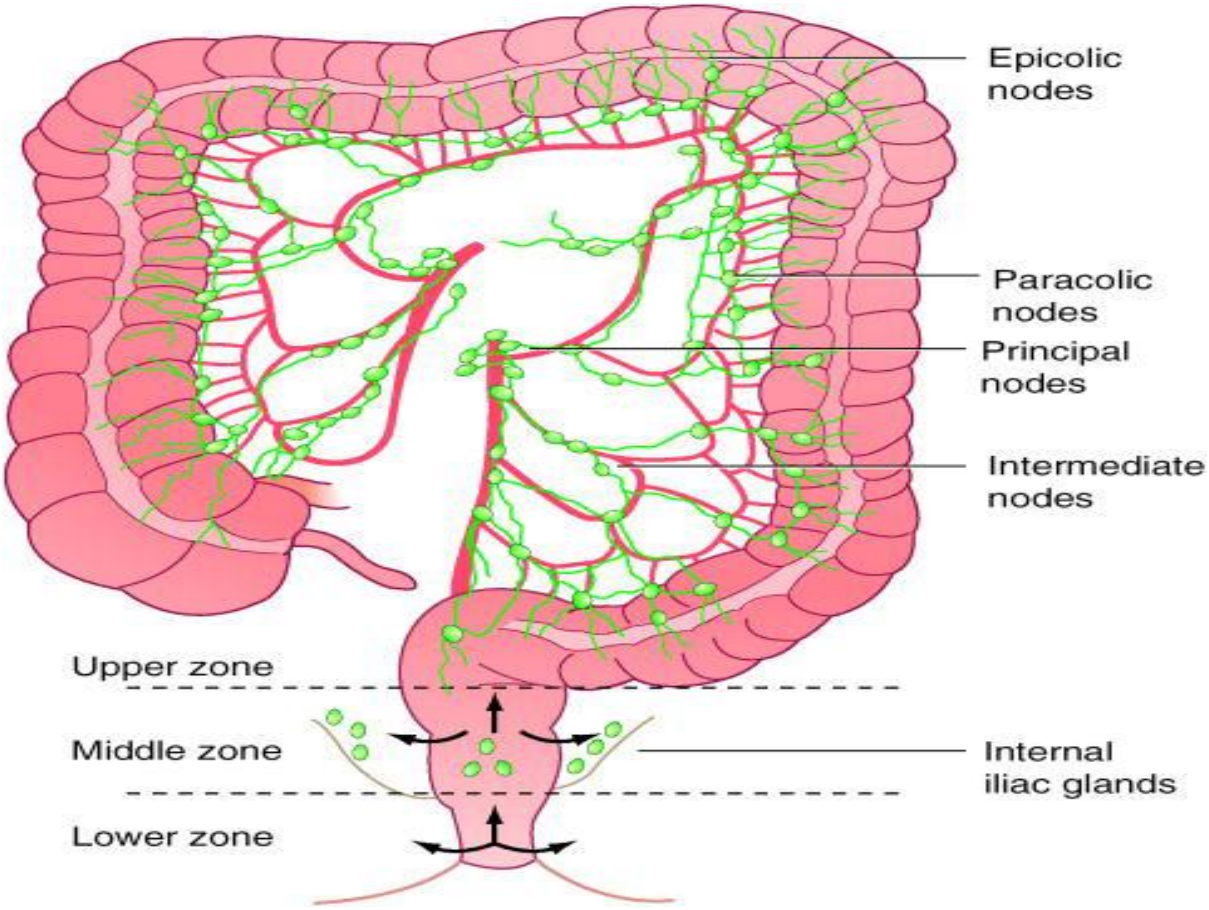
Midgut derivatives - Superior Mesenteric Vein

Hindgut derivatives – Inferior Mesenteric Vein



Lymphatic drainage

Is mainly through the mesentery into the paracolic groups of lymph nodes located along the marginal vascular arcades. Subsequent stations are the intermediate nodal groups (more proximal, at the level of major arterial branches), the central or principal lymph nodes (adjacent to the sup and inf mesenteric vessels), and the entire para-aortic chain..



NERVE SUPPLY

- Extrinsic nerves:

  Sympathetic – Inhibitory

  Preaortic ganglia - T6 – T12 – caecum, appendix, asc.colon, tr. Colon

  Preglnic lumbar splanchnics L1 – L3 – Left colon, rectum

- Parasympathetic – Stimulatory

  Rt vagus – Rt. Colon & Tr. Colon

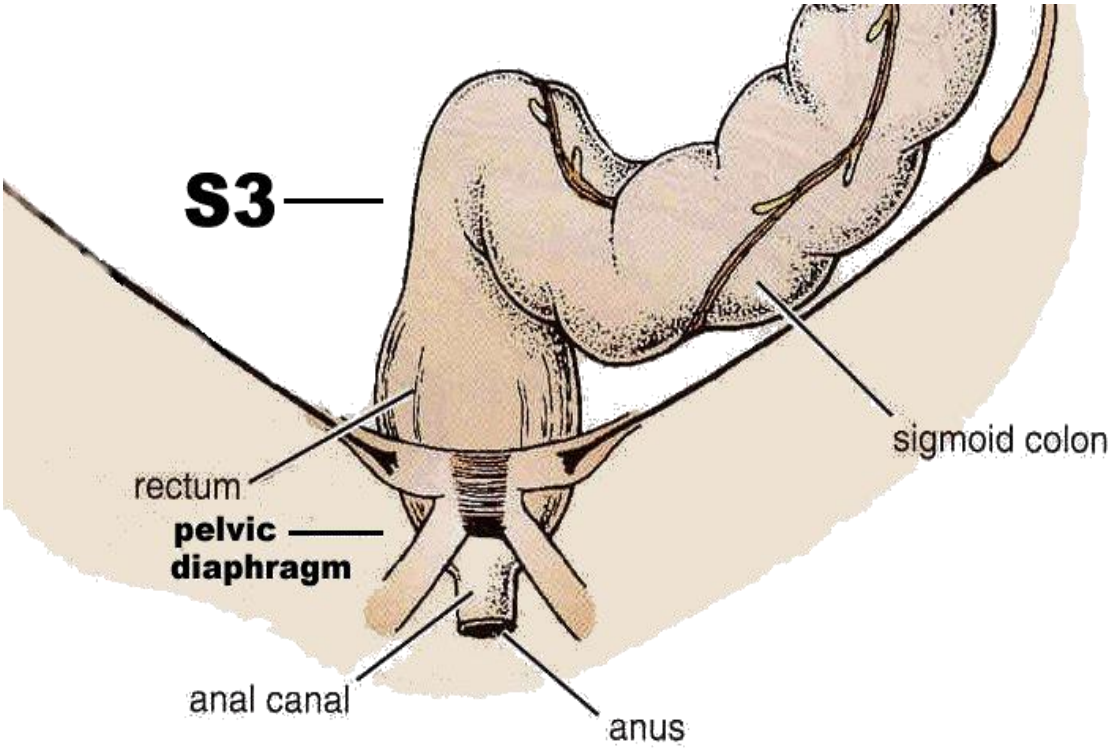
  S2 – S4 – Nervi erigentes – Left colon & rectum

- Intrinsic nerve plexus supplied with ganglion cells in muscular & submucous coats co-ordinates purposeful emptying movts in colon & rectum – * congenital megacolon

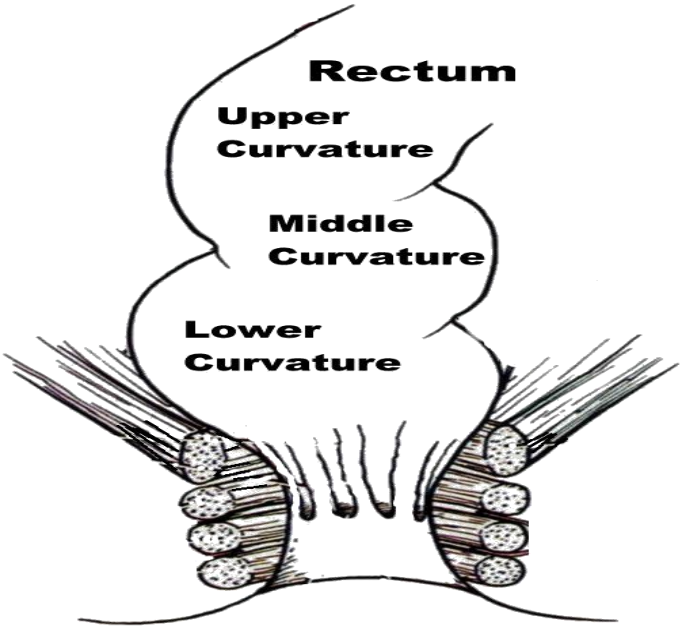
ANATOMY OF RECTUM :

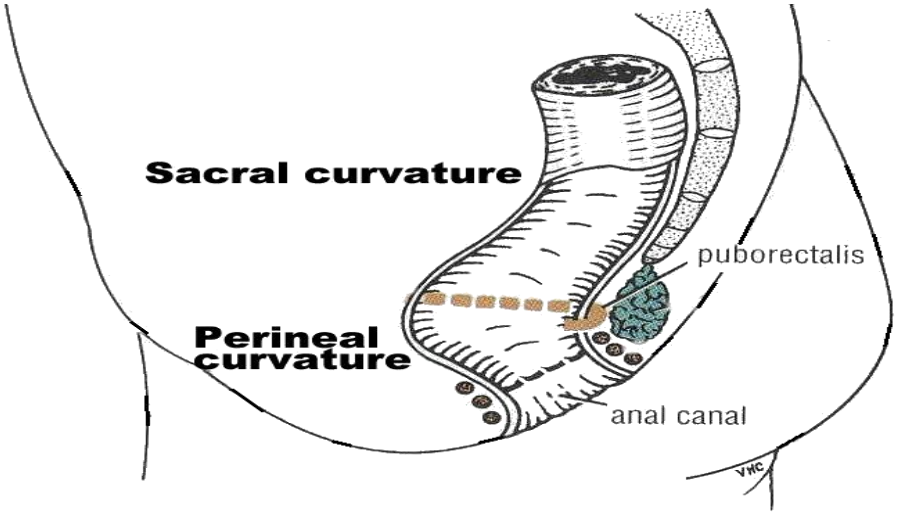
Length of rectum is 12 cm

- Rectum starts at S3 and follows the curve of the sacrum
- It has 3 lateral curve 2 in the left side ,1 in the right side
- It enters as anal canal at the level of levator ani - puborectalis
- Dilated part is called ampulla



Lateral curvatures – 3 & Antero – posterior curvatures - 2





INTERIOR OF RECTUM :

HOUSTON VALVES

1ST-S3vertebra,left / right

2nd-(left)

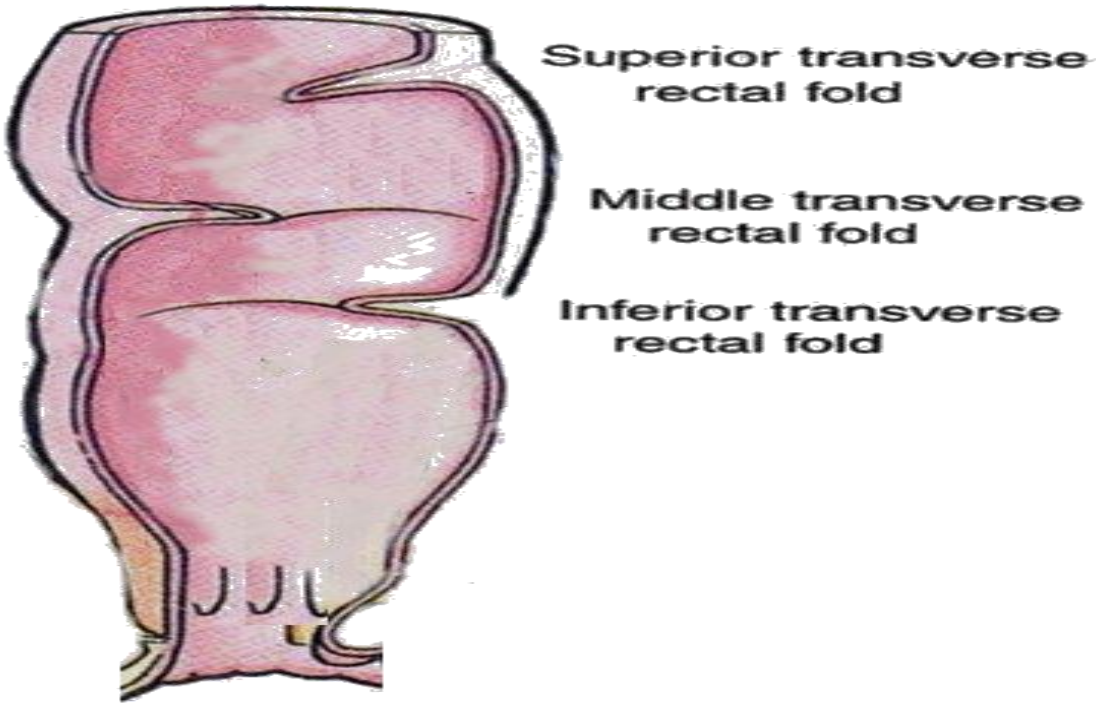
3rd-most imp & constant

(right)…S5 vertebra

4th-(left)

Functions

Support the weight of faeces



PERITONEAL COVERING OF RECTUM :

Peritoneum covers anterior and lateral sides in the upper part

It covers only anterior portion in the middle part

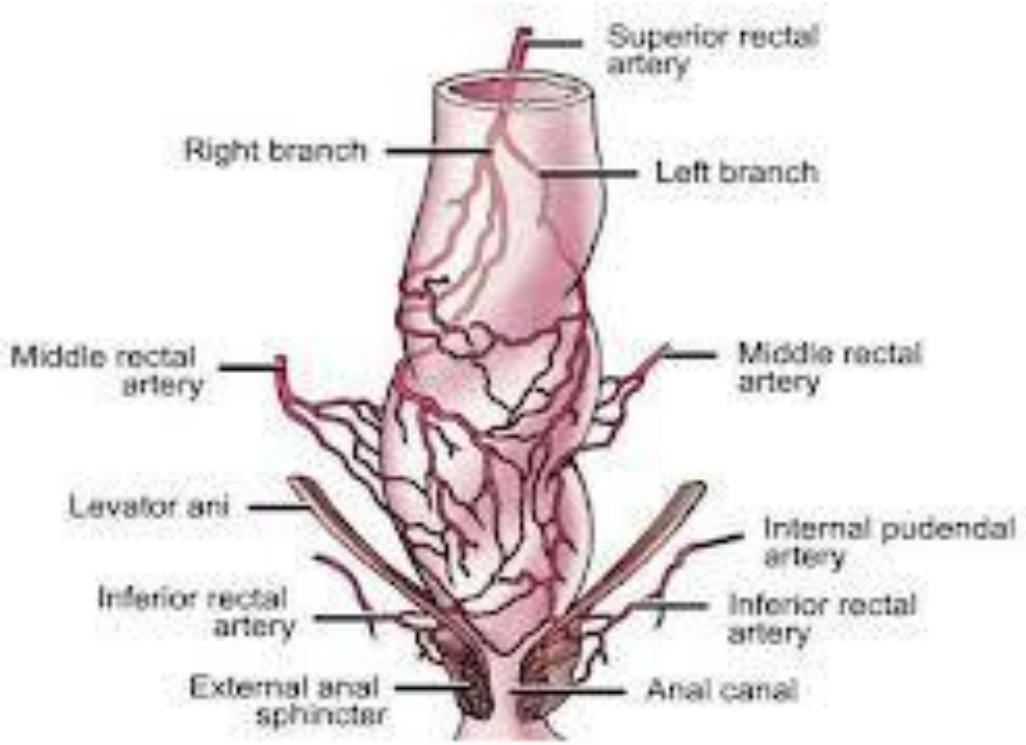
No peritoneal covering in the lower part

BLOOD SUPPLY OF RECTUM :

Superior rectal Artery - a branch of Inf.Mesentric.Artery

Middle rectal A -Internal iliac Artery

Inferior rectal A -Internal iliac Artery



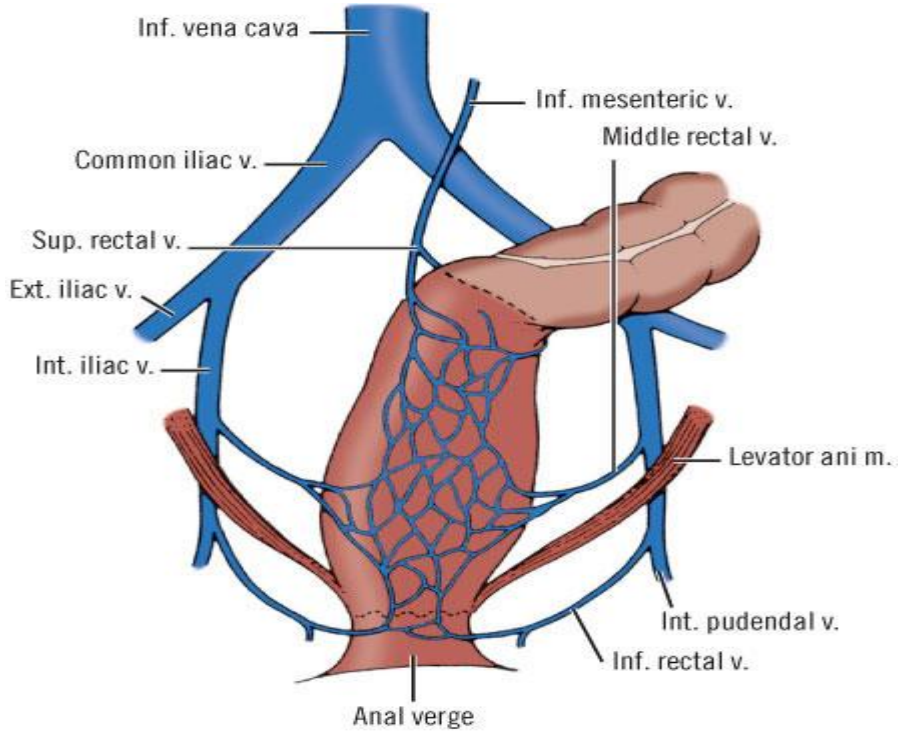
Anterior View

VENOUS DRAINAGE :

Of Rectum - Sup.Rectal .Vein - Portal circulation

Middle.Rectal.Vein- syst.circulation

Inf .Rectal. Vein - Systemic circulation



NERVE SUPPLY :

Sympathetic – Hypogastric nerve

Hypo gastric plexus

- at sacral promontary

Pelvic plexus

– At lateral wall of the rectum

Para sympathetic –Nervi ergentis

Pelvic plexus

- SYMPATHETIC-superior hypogastric plexus(L1,L2)
- PARASYMPATHETIC -pelvic splanchnic nerves.

MESORECTUM :

- Anatomically the word is a misnomer
- It is a cushion of fatty tissue,that surrounds the rectum postero laterally and is covered by a membrane called fascia propria

FASCIA RECTUM :

Fascia propria

Visceral layer of the endo pelvic fascia covering the meso rectum

Denonvilliers fascia

Interposed between rectum and bladder

Waldayers fascia

Between rectum and sacrum contains S.R.A

Lateral ligament of the rectum

Between mesorectum and pelvic sidewall contains M.R.A and nervi erigentis

Normal Histology

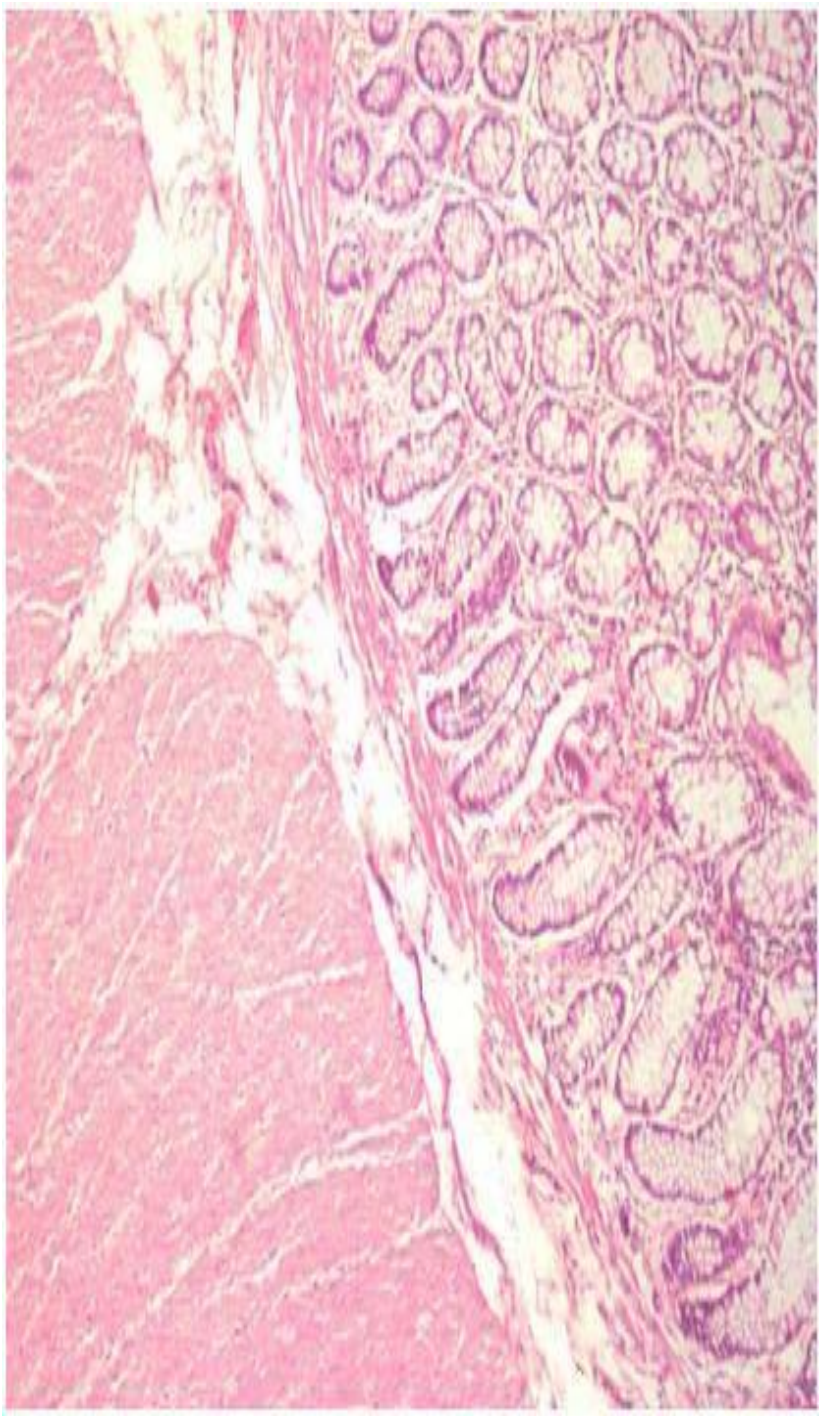


Figure 1: Histology of Colon (H&E X40)

The gut wall has four main layers

mucosa,

submucosa,

muscularis externa and

serosa (Fig 1).

The mucosa is pale, smooth in the colon but in the rectum it is thicker, darker, more vascular, and more loosely attached to the submucosa. The mucosa has three components: Epithelium, laminapropria and muscularis-mucosae .

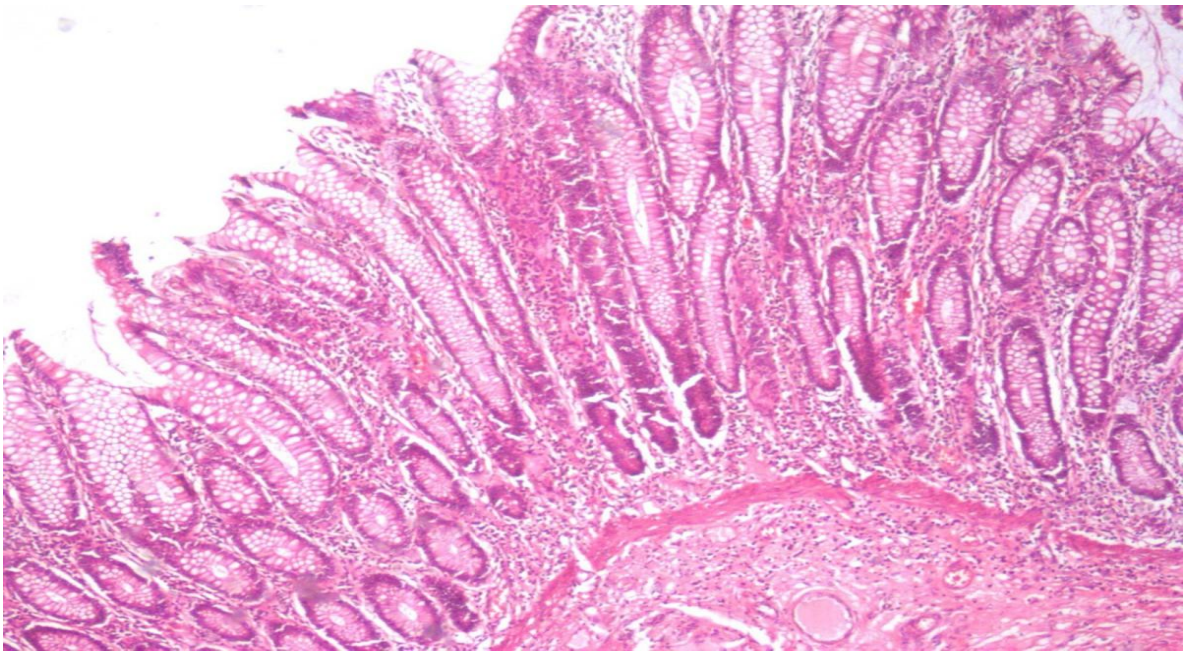


Figure 2: Normal Colonic Mucosa (H&E X40)

The mucosal surface is covered by a layer of columnar to cuboidal epithelium Crypts of Lieberkuhn open here. The surface epithelium is composed of absorptive cells (with basally located nuclei, mucin-negative acidophilic cytoplasm, and luminally directed apical striated borders) and goblet cells (which synthesize, store, and secrete mucin granules). Lymphocytes and occasional eosinophils are present between the surface epithelial cells. The crypts are long, tubular in shape, and are arranged parallel to each other. The crypt epithelium contains mature absorptive cells, goblet cells and immature and undifferentiated precursor cells. These stem cells are located at or near the bases of the intestinal glands, where they divide by mitosis. They provide cells that migrate towards the luminal surface of the intestine further undergo differentiation later apoptosis and are shed after approximately 5 days. Few endocrine cells and Paneth cells dominate at the base of the crypts. **Paneth cells** contain numerous eosinophilic secretory granules, lysozymes, epidermal growth factor, and other substances. They are usually present only in the **cecum** and **proximal right colon.**

Lamina propria

The lamina propria is composed of connective tissue to support the epithelium.

Solitary lymphoid follicles within the lamina propria are most abundant in the caecum, appendix and rectum, but are scattered along the rest of the large

intestine. Few plasma cells, histiocytes, and mast cells are seen scattered in a network of collagen fibers, smooth muscle bundles, vessels, and nerves. The lamina propria does not contain any lymphatic vessels.

Muscularis mucosa

The muscularis mucosa of the large intestine has prominent longitudinal and circular layers.

Submucosa

The submucosa is composed of loose connective tissue containing vessels, lymphatics & sub mucosal neural plexus of Meissner.

Muscularis externa

The muscularis externa has outer longitudinal and inner circular layers of smooth muscle with the myenteric neural plexus of Auerbach lying between them. The longitudinal fibers form a continuous layer, macroscopically aggregated as longitudinal bands or taeniae coli. The circular fibres form a thin layer over the caecum and colon and form a thick layer in the rectum. In the anal canal they form the internal anal sphincter.

Serosa

The serosa or visceral peritoneum forms small fat-filled appendices epiploicae.

Subserous loose connective tissue attaches the peritoneum to the muscularis externa. The serosa has a single layer of flattened to cuboidal cells and the subjacent fibro elastic tissue. Interstitial cells of Cajal are present scattered throughout the wall. Immunohistiochemically, the epithelial cells of the normal colonic mucosa contain CK8, 18, 19, and 20, but not CK7. Immunoreactivity for CK19 increases as the cells progress up the crypt toward the surface.

PHYSIOLOGY OF COLON AND RECTUM:

FUNCTIONS :

- **SECRETION**
- **ABSORBTION**
- **EXCRETION**
- **SYNTHETIC**
- **DIGESTION**

SECRETIONS OF LARGE INTESTINE

- REGULATED BY NEUROHORMONAL AGONIST
- WATERY SECRETION PH 8
- COMPOSED OF WATER 99.5 %,SOLIDS 0.5%
- ORGANIC SUBSTANCES - ALBUMIN, GLOBULIN, MUCOUS, UREA
- IN ORGANIC SUBSTANCES - $HCO3^-$, K +

SECRETIONS USE :

- NUETRALISATION - HIGH HCO3 NEUTRALISES ACIDS PRODUCED BY BACTERIAS
- LUBRICATION - MUCUS
  - PROTECTS WALL AGAINST EXCORIATION
  - HOLDS FAECES
  - PROTECTS WALL FROM BACTERIAL ACTIVITY

ABSORPTION

- 5-7 LITRES FLUIDS
- WATER
- ORGANIC-GLUCOSE ,STEROIDS ,SEDATIVES ANAESTHETICS
- INORGANIC - Na , CI

CONSERVATION OF Na+

- VITAL TO FLUID AND ELECTROLYTE BALANCE
- ENHANCED BY ALDOSTERONE, GLUCOCORTICOIDS, STOMOTOSTATIN,SHORT CHAIN FATTY ACIDS
- DEHYDRATION- ILEOSTOMY PTS WHEN PLACED IN LOW Na DIET

EXCRETION

- **HEAVY METALS -** MERCURY ,LEAD, ARSENIC ,BISMUTH
- **SYNTHESIS OF VITAMINS**
- **BACTERIAL FLORA -VITAMINS** FOLIC ACID ,VIT K , VIB12
- **DIGESTION -** NO DIGESTIVE ENZYMES

COLONIC METABOLISM

- SHORT CHAIN FATTY ACIDS
  - PROXIMAL COLON
  - FERMENTATION OF CARBOHYDRATES
  - AUGMENTS ABSORBTION OF Na+Cl- , H20
  - COMBAT INFLAMATION
  - CONTRIBUTES TO TOTAL CALORIES
  - PROMOTES WOUND HEALING IN COLON
- REGIONAL HETEROGENEITY
- RIGHT COLON – RESERVOIR FOR MIXING AND STORAGE
- LEFTT COLON- CONDUIT
- RECTOM AND ANAL CANAL- DEFAECATION AND CONTINENCE
- RIGHT HEMICOLECTOMY- LEFT COLON AUGMENTS STORAGE CAPACITY WITHIN 6 MONTHS

MOVEMENTS OF LARGE INTESTINE

- NON PROPULSIVE MOVEMENTS
- SEGMENTATION CONTRACTIONS

  -MIXING MOVEMENTS :CIRCUMFERNTIAL

  -REGULAR DISTANCE

MOVEMENTS OF LARGE INTESTINE

- **PROPULSIVE MOVEMENTS**
- **MASS PERISTALIS**
- **HIGH AMPLITUDE PROPAGATIVE CONTRACTIONS (HAPC)**

  -PROPULSIVE MOVEMENTS -

  DURATION 10 MIN -

  NEUROGENIC FACTORS , GASTROCOLIC REFLEX, PARASYMPATHETIC STIMULATION

HIGH AMPLITUDE PROPAGATIVE CONTRACTIONS (HAPC)

- ORIGINATES PREDOMINANTLY IN CAECUM AND ASCENDING COLON
- 6 TIMES PER DAY
- ACCOUNTS FOR URGE TO DEFAECATE
- INDUCED BY NEOSTIGMINE, BISOCODYL, GLYCEROL

GASTRO COLIC REFLEX

- COLONIC MOTOR RESPONSE TO EATING
- BEGINS WITHIN FEW SECONDS OF EATING
- LASTS UPTO 2.5 HRS
- INFLUENCED BY MEAL COMPOSITION AND CALORIC CONTENT >500 KCAL
- PRESERVED EVEN AFTER GASTRECTOMY

DEFAECATION

- SPINAL REFLEX
- URGE TO DEFAECATE-18mmHg
- RECTUM USUALLY EMPTY
- FACTORS--DETERMINING

  ADULTS- HABITS, CULTURAL,

  CHILDREN- GASTRO COLIC REFLEX
- CONTENTS EXPELLED >55mmHg

FAECAL CONTINENCE

- PUBO RECTALIS
- ANO RECTAL ANGLE >80
- SQUATTING

ANAL PRESSURE

- RESTING TONE
- 70-100CM H2O
- INTERNAL SPHINCTER

RESTING STATE-SLOW SINUSOIDAL WAVES,1. CONSTANT SINUSOIDAL PATTERN

2.WAXING-WANING PATTERN

FAECES

- **COMPOSITION**

WATER -75%

SOLIDS -25% CELLULOSE&OTHER INDIGESTABLE FIBRES-VARIABLE% ,

BACTERIA 30% ,INORGANIC Ca, P -15%,FAT & DERIVATIVES 5%

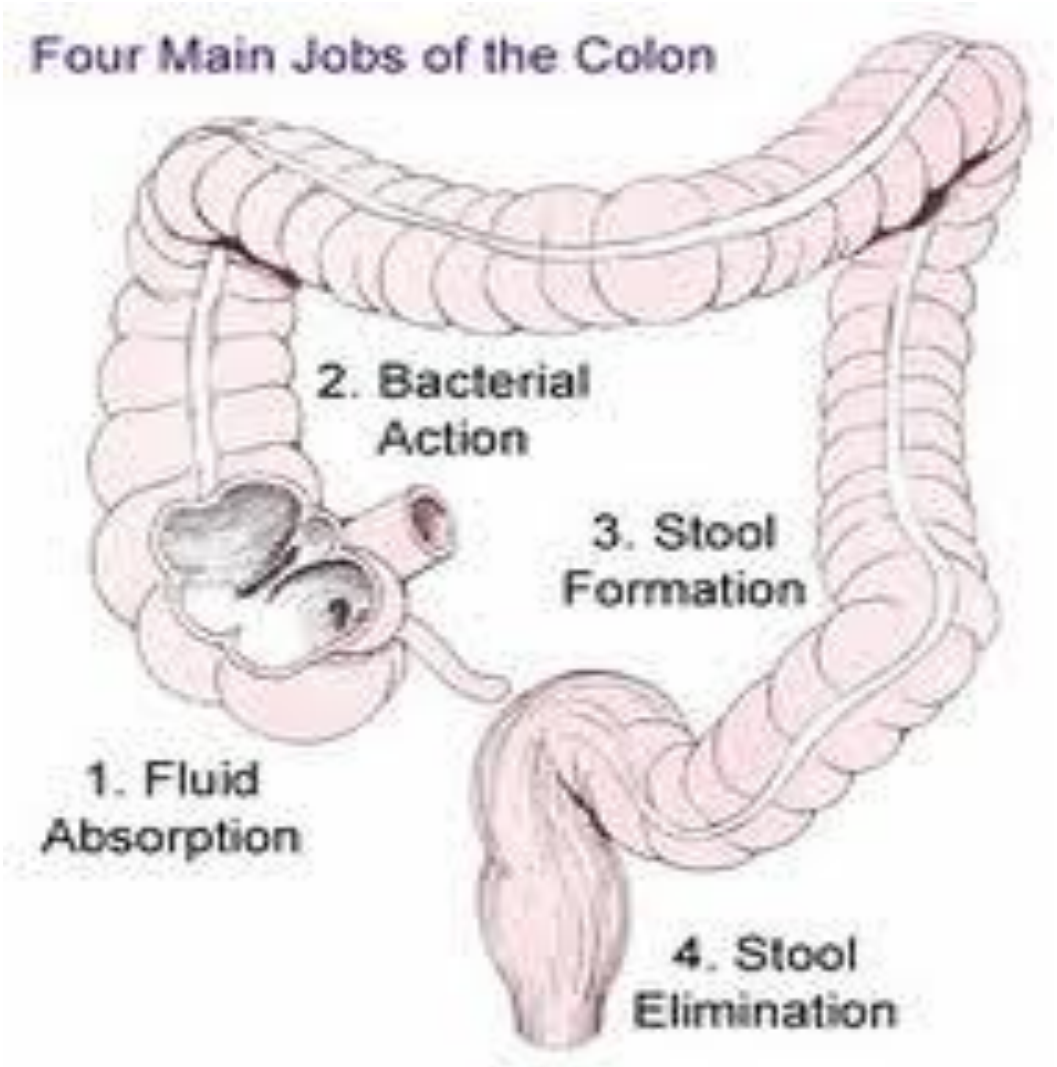
FAECES

COLOUR -STERCOBILIN ,UROBILIN

- ODOUR - INDOLE,SKETOLE,MERCAPTANS, H2S
- STORAGE - SIGMOID COLON
- 200-250ML

FLATUS

- SWALLOWING
- FERMENTATION
- DIFFUSION
- COMPOSITION-NITROGEN 12-60%,CO_2 - 40 % , H_2,METHANE - 20% ,NH_3,H_2S <1%[ODOUR]
- 400-600ML



C O L O - R E C T A L C A R C I N O M A

I N T R O D U C T I O N :

Colorectal cancer is the 2nd common malignancy in western countries with many patients dying per annum in the U.K . The rectum is the most frequent site involved . One of the most common GI malignancies .Found to occur in both *familial and sporadic* forms.Occurrence of familial cancer syndromes provides opportunity for screening in relatives of affected individuals .Early detection provides opportunity for curative surgery especially in those with familial cancers.

EPIDEMIOLOGY :

Occurs most commonly in the 6^{th} to 7^{th} decade in the sporadic form but much earlier in the familial syndromes. *Dietary and environmental factors* are a major factor in the occurrence of colorectal cancers. This is primarily a cancer of the affluent Western population .Various risk factors have been identified with relation to colo rectal cancers .

RISK FACTORS :

Diet and lifestyle

A h i g h incidence is observed in populations with a diet rich in animal fat and calories, Low fiber intake and a sedentary lifestyle also contribute to the risk. Epidemiological studies have indicated that m e a t consumption, smoking and alcohol consumption are risk factors

Meat and heterocyclic amines

Excessively cooked meat contains heterocyclic amines and nitrosamines which are carcinogens and produce mutations in Adenomatous Polyposis Coli (APC *)* and occasionally in K-ras . .

Smoking

Tobacco smoke contains heterocyclic amines, polycyclic hydrocarbons and nitrosamines which are carcinogenic. Evidence suggests that APC may be a target for heterocyclic amines.

Alcohol

Alcohol consumption has been associated with increased CRC risk in males. Acetaldehyde is a potent adduct former which may result in inhibition of DNA repair besides alcohol.

C a l c iu m and B i le a c i d s :

Bile acids serve as promoters or comutagens colonic carcinogenesis.

Calcium in diet converts bile acids into insoluble salts .

Selenium:

Epidemiological and intervention studies have shown a protective role of selenium in colorectal cancer.

Physical Activity and Body Mass

Physical activity may stimulate colonic peristalsis, thereby decreasing the time that colonic contents are in contact with the epithelium. Higher physical activity is associated with a general metabolic milieu that is less favourable for colon cancer.

Vegetables, folate , fiber, and anticarcinogens

Fiber consumption - 40 gm/day per person might decrease the risk of colon cancer by 50% by increasing the stool bulk and reducing the transit time. This decreases the exposure of mucosa to the carcinogenic agents, increases the capacity of certain fibers to bind carcinogens and thereby protect the mucosa.High fat intake increases the level of bile acids in the gut, which in turn modifies intestinal flora, favoring the growth of microaerophilic bacteria. Bile acid metabolites produced by these bacteria may function as carcinogens.

Nonsteroidal Anti-inflammatory Drugs (NSAIDs)

Studies suggest that aspirin or other NSAIDs have a protective effect by inhibiting the enzyme cyclooxygenase-2 (COX-2), necessary for producing prostaglandin E2, which promotes epithelial proliferation, particularly after injury. COX-2 is over expressed in adenomas and carcinomas.

G ENETIC PRE DISPOSITION— IN HERITED SYNDROMES

F amilial Adenomatous Polyposis (FAP)

FAP is an autosomal dominant syndrome caused by an inherited mutation in the Adenomatous Polyposis Coli (APC) gene. It is characterized by the development of multiple colorectal adenomas, numbers varying from a few polyps to several thousand.

Familial Adenomatous Polyposis Syndrome is due to *mutation in APC gene* (a tumor suppressor gene located in the long arm of chromosome 5 locus 21)

100% risk of developing malignancy

Classic FAP – about 500 to 2500 colonic adenomas throughout the colon (minimum 100 is necessary for diagnosis)

Attenuated FAP – few polyps (average 30) located in proximal colon. Lifetime risk of developing into malignancy is about 50%

FAP VARIANTS

GARDNER SYNDROME

Intestinal polyp (like classical FAP), multiple osteomas (of mandible, skull, long bones…), epidermoid cysts, fibromatosis & desmoid tumors, dental abnormalities, CHRPE (Congenital Hypertrophy of Retinal Pigment Epithelium), duodenal & thyroid cancer

TURCOT SYNDROME

Combination of adenomatous polyposis and tumors of CNS (medulloblastoma in 2/3rd associated with mutation in APC & in 1/3rd associated with HNPCC develop glioblastoma)

HEREDITARY NON – POLYPOSIS CARCINOMA COLI

(HNPCC / LYNCH SYNDROME)

Hereditary Non Polyposis Carcinoma Coli - name is a *misnomer* as this syndrome is also characterized by polyps but they are few in number and rapidly progress to carcinoma. Autosomal Dominant type of inheritance.

Two varieties are identified :

Lynch Syndrome I

Risk of developing colon cancer (70-80%) alone, without other cancers

Lynch Syndrome II

Risk of developing cancers of ovary, breast, endometrium, stomach, bile ducts, small bowel, kidney, ureter, bladder *in addition to colon cancer*

.Colon cancers in HNPCC patients occur at younger ages and are often located in the right colon.

HNPCC is caused by inherited mutations in mis-match repair genes .

Majority of HNPCC cases involve MSH2 and MLH1.

Diagnosis of HNPCC

Amsterdam Criteria

1. **One member diagnosed with CRC before 50 yrs.**
2. **Two Affected generations**
3. **Three affected relatives with one being an FDR of the other two**
4. **FAP is excluded**
5. **Pathologic confirmation**

FDR = First Degree Relative

Amsterdam Criteria II

- **Same as that of Amsterdam criteria but it includes all HNPCC associated cancers diagnosed before 50 years and not just colo rectal cancer.**

BETHESDA CRITERIA :

1. **Indi viduals in families that meet the Amsterdam criteria**
2. **Indi viduals with two HNPCC related cancers (CRC/Extracolonic)**
3. **Indi viduals with CRC and an FDR with CRC, HNPCC related cancer or colorectal adenoma (cancer diagnosed <45 yrs., adenoma <40 yrs of age)**
4. **Indi viduals with CRC or endo -metrial cancer diagnosed <45 yrs of age**
5. **Indi viduals with undifferentiated right sided CRC diagnosed <45 yrs of age**
6. **Indi viduals with signet ring CRC diagnosed < 45 yrs**
7. **Indi viduals with adenomas diagnosed < 40 yrs of age**

Chronic inflammatory conditions such as ulcerative colitis and colonic Crohn disease develop CRC as a long term complication. This follows the dysplasia –carcinoma sequence.

Irradiation is also one of the aetiological factors in colorectal neoplasia following therapeutic pelvic irradiation.

Molecular genetic features

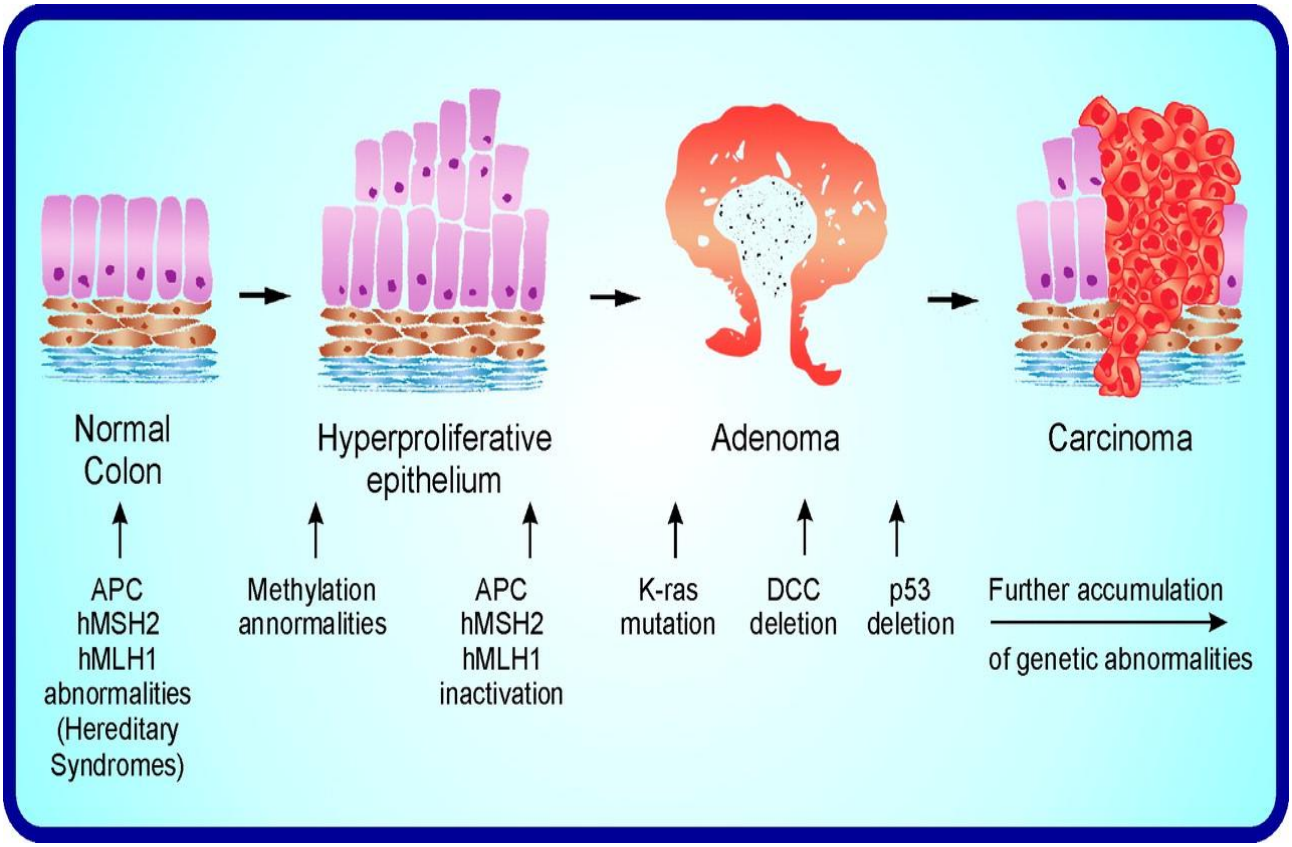
CRC is traditionally divided into sporadic and familial (hereditary) cases.

For 75%-80% of colo-rectal tumours , origin is sporadic. A high proportion of patients have one 1^{st} to 3^{rd} -degree relative with CRC. There are two major pathways in colorectal carcinogenesis.

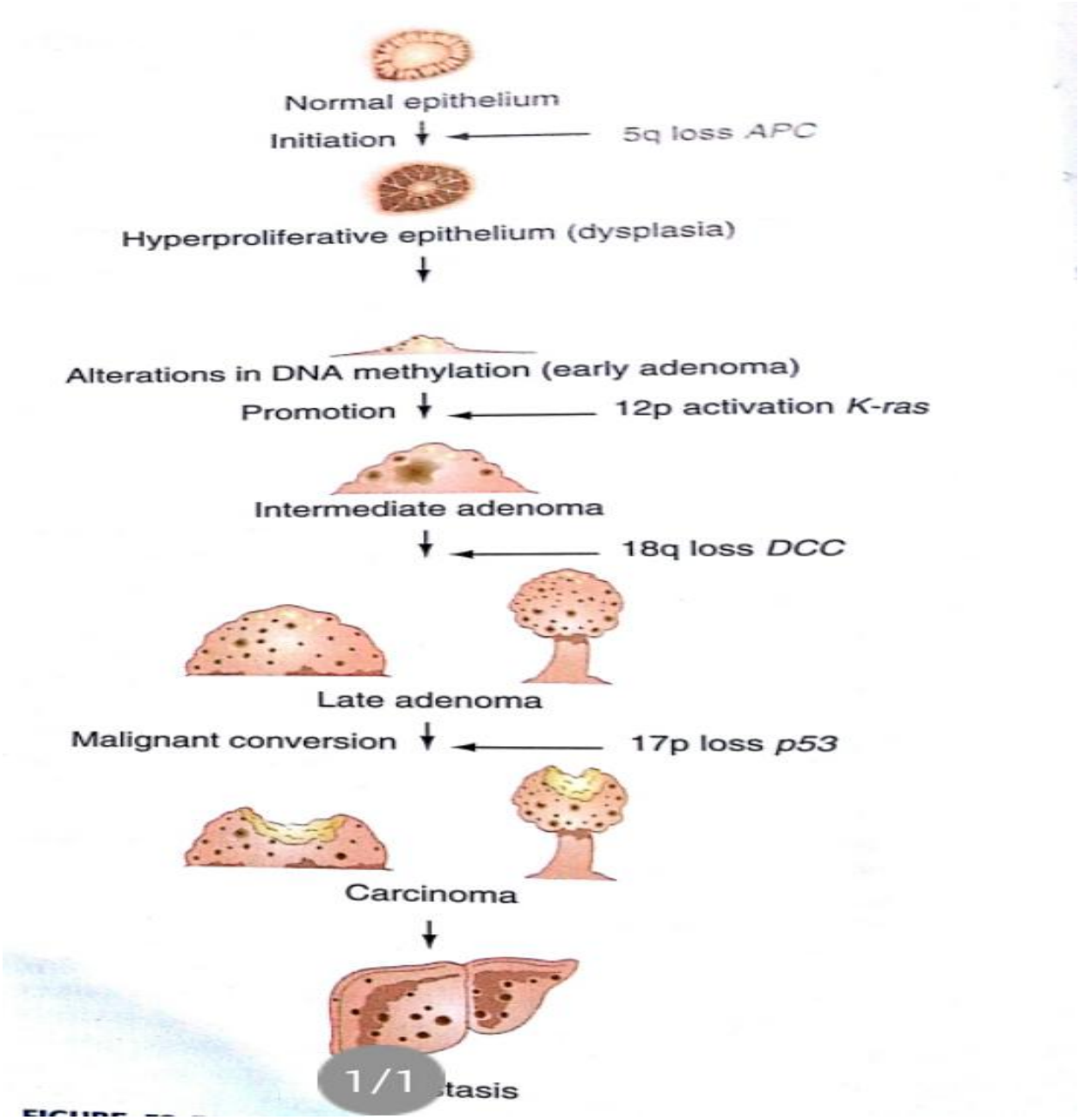
The classic a d e n o m a-c a r c i n o m a sequence and the second pathway involves microsatellite instability (MSI). Both pathways involve the by which the mutations accumulate differ.

ADENOMA – CARCINOMA SEQUENCE :

- This theory was propounded by ***Fearon & Vogelstein***
- It describes the orderly progression of adenomas to carcinomas and the mutations at various steps of the same.
- This proceeds in a step by step fashion in the form of *adenoma → dysplasia → metaplasia → carcinoma*
- The advantage is that the time frame for such a progression is between 5 – 10 years that gives us *ample time for detection and screening* and hence for curative measures



This pathway is present in 80%-85% of CRC. The development of CRA is a multistep process which can arise due to accumulation of molecular alterations including chromosomal abnormalities, genetic mutations with activation of oncogenes coupled with inactivation of tumour suppressor genes and epigenetic changes.



An orderly progression of carcinoma

GROSS TYPES :

ANNULAR , TUBULAR , ULCERATIVE , CAULIFLOWER LIKE

CLASSIFICATION OF COLONIC TUMORS

Epithelial tumors

- Adeno carcinoma
- Mucinous adeno carcinoma
- Small cell carcinoma
- Squamous cell carcinoma

Non epithelial tumor

Carcinoid,GIST, nodular lymphoid hyperplasia ,lymphoma

Secondary tumors

ANNULAR

- Stenosing type
- - Common in Lt side colon
- - growth spreads around the internal wall. Circumferential growth
- -Intest inal obstruction

PROLIFERATIVE

-Common in Right side colon

- fleshy polypoid and bulky growth

- less malignant

ULCEROPROLIFERATIVE

- Exophytic (polypoid/fungating)

- Ascending colon & caecum.

- Right side mass and anemia

SYMPTOMS OF COLORECTAL CANCER

- ✓ ***Change in bowel habit***
- ✓ **Abdominal pain**
- ✓ ***Bleeding per rectum***
- ✓ **Passage of mucus**
- ✓ **Weight loss**
- ✓ ***Abdominal mass***
- ✓ ***Tumour protrusion through anal orifice***
- ✓ **Rectourethral/ Rectovesical fistula**
- ✓ **Rectovaginal/ Rectouterine fistula**

Other less common presentations are

- **Abscess**
- **Fistula**

Symptoms due to metastases

- **5% of patients present with symptoms related to metastases only ,the primary tumor remaining "silent ".**
- **They are**

Bone pain

Jaundice

Pathological fracture

Neurological symptoms

Personality changes

Thrombophlebitis migrans (Trousseau Syndrome)

Dermatological problems like

- Acanthosis nigrans
- Dermatomyositis
- Pemphigoid
- Pyoderma gangrenosum

Skin nodules particularly at umbilicus- SISTER JOSEPH NODULE

- Multiple Liver Metastases
- Liver Metastases
- Brain Metastases
- Cannon Ball Metastases

Acute Abdomen in CRC :

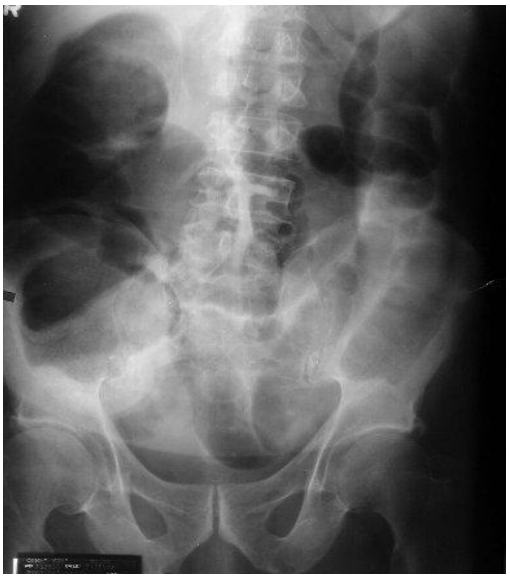
∫ **CRC can present as an acute abdomen in the form of**

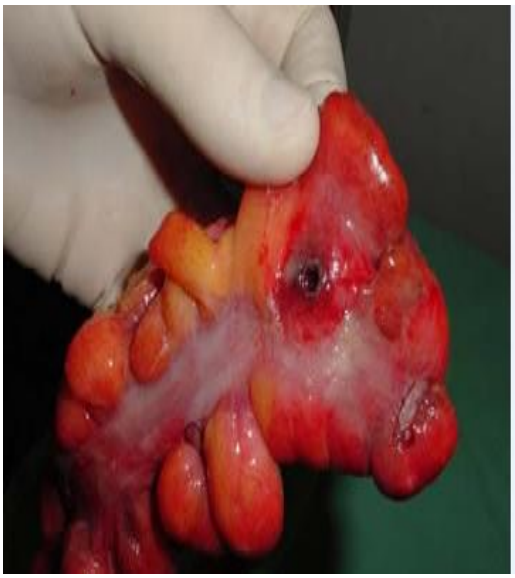
∫ **Intestinal obstruction (acute/ sub acute)**

∫ **Lower GI bleed**

∫ **Perforation secondary to pre op preparation or obstruction**

∫ **Pelvic abscess secondary to perforation**





MODIFIED DUKE'S CLASSIFICATION :

<u>Stage A</u>:- Limited to Mucosa

<u>Stage B1</u>:- Into Muscularis Propria

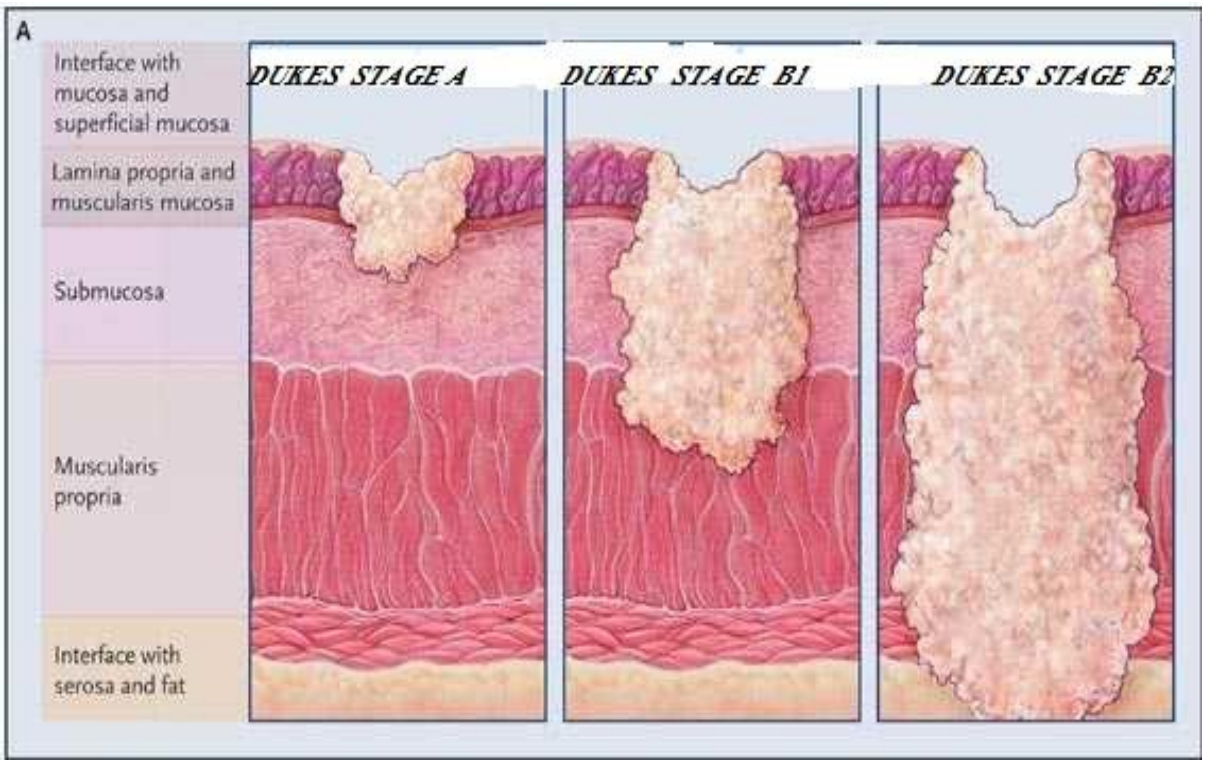
<u>Stage B2:-</u> Through serosa

<u>Stage C1</u>:- Any tumor with involvement of 1- 4 regional lymph nodes

<u>Stage C2:-</u> Any tumor with involvement of >4 regional lymph nodes

<u>Stage C3:-</u> >4 regional lymph nodes

<u>Stage D:-</u> Distant Metastases



MODIFIED ASTLER -COLLER CLASSIFICATION OF THE DUKE'S STAGING SYSTEM FOR COLORECTAL CANCER :

STAGE A : LESION NOT PENETRATING SUB – MUCOSA

STAGE B1 : LESION INVADES , BUT NOT THROUGH THE MUSCULARIS PROPRIA

STABE B2 : LESION IVADES THROUGH INTESTINAL WALL , NO ADJACENT ORGAN INVOLVEMENT

STAGE C1 : LESION B1 INVASION DEPTH , REGIONAL LYMPH NODE METASTASIS

STAGE C2 : LESION B2 INVASION DEPTH , REGIONAL LYMPH NODE METASTASIS

STAGE C3 : LESION B3 INVASION DEPTH , REGIONAL LYMPH NODE METASTASIS

STAGE D : DISTANT METASTATIC DISEASE

TNM CLASSIFICATION OF THE TUMOURS OF COLON & RECTUM

T – Primary Tumour

T_x- Primary tumour cannot be assessed

T_0- No evidence of primary tumour

Tis- Carcinoma in situ: intraepithelial or invasion

of lamina propria.

T_1- Tumour invades submucosa

T_2- Tumour invades muscularis propria

T_3- Tumour invades through muscularis propria

into subserosa/ into non-peritonealized pericolic or perirectal tissues

T4a - Perforates visceral peritoneum

4b- Tumour directly invades other organs or Structures

N – REGIONAL LYMPH NODES

Nx- Regional lymph nodes cannot be assessed

N_0- No regional lymph node metastasis

N_1- N1a – one regional Lymph Node

N1 b – 2 or 3 regional Lymph Nodes

N1 c – tumour deposits sub serosa and mesentry , pericolic/ perirectal tissue without Lymph Nodes

N_2- Metastasis in 4 or more regional lymph nodes

N2 a- Metastasis in 4 to 6 regional lymph nodes

N2 b – Metastasis in 7 or more regional lymph nodes

M – Distant Metastasis

M_x- Distant metastasis cannot be assessed

M_0- No distant metastasis

M_1- Distant metastasis.

a – metastasis confined to 1 organ / site (liver ,lung ,ovary)

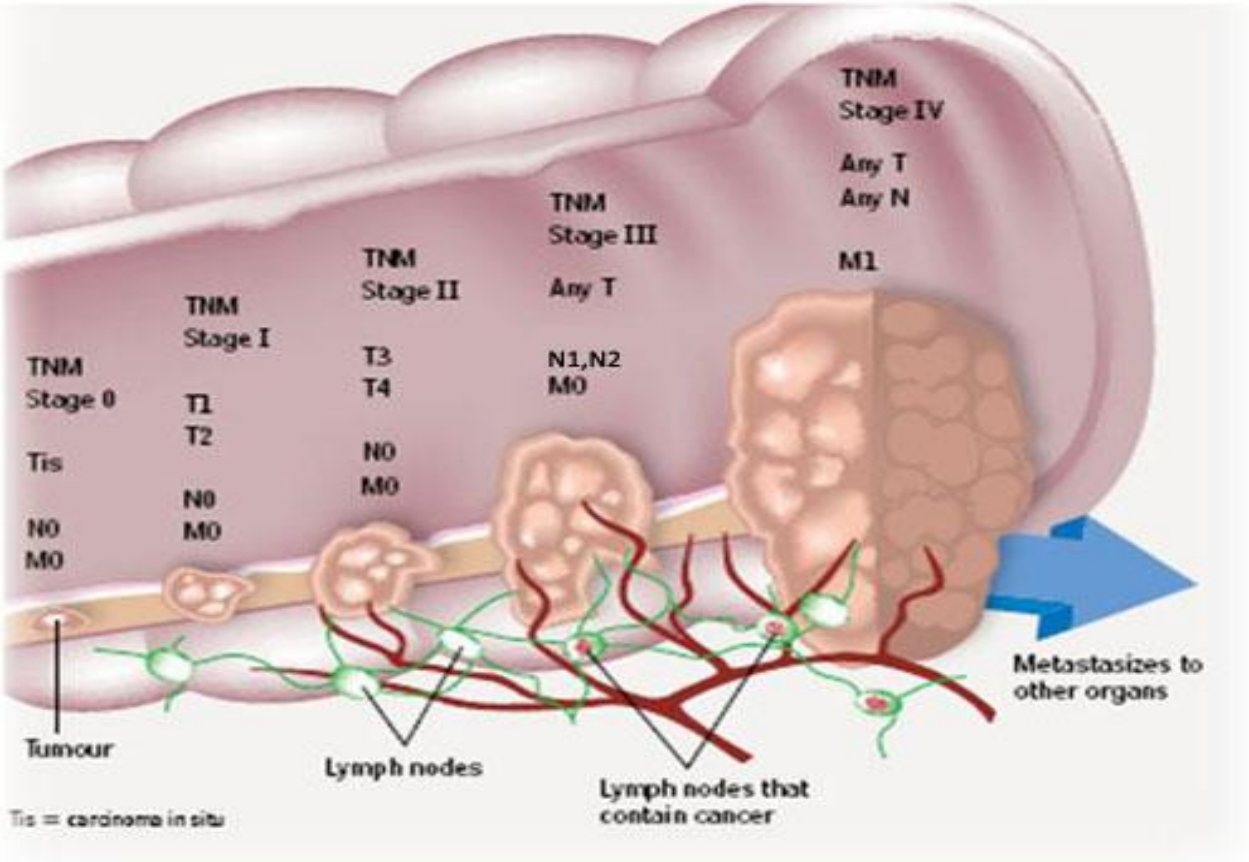
b – metastasis to more than 1 organ / site/Peritoneum

STAGE I	**T1** **T2**	**No**	**Mo**
STAGE -II A	**T3**	**No**	**Mo**
STAGE - II B	**T4A**	**No**	**Mo**
STAGE - II C	**T4B**	**No**	**Mo**
STAGE - III A	**T1-T2** **T1**	**N1/N1C** **N2A**	**Mo** **Mo**
STAGE - III B	**T3-T4A** **T2-T3** **T1-T2**	**N1/N1C** **N2A** **N2B**	**Mo** **Mo** **Mo**
STAGE - III C	**T4A** **T3-T4A**	**N2A** **N2B**	**Mo** **Mo**
STAGE - IV A	**ANY T**	**ANY N**	**M1A**
STAGE - IV B	**ANY T**	**Any n**	**M1B**

AJCC - TNM STAGING SYSTEM :

Histologic grade

- **Gx – Grade can't be assessed**
- **G1 – well differentiated**
- **G2 – moderately differentiated**
- **G3 – poorly differentiated**
- **G4 – un differentiated**



INVESTIGATIONS :

1.COMPLETE H E M O G R A M

2.B L OOD SUGAR

3.B L OOD UREA

4.SERUM CREATININE

5.L IVER F UNCTION TESTS

6.C OAGULATION PROFILE

7. S ERUM ELECTROLYTES

H alf of the patients are anaemic .I r o n deficiency anaemia of un-determined etio logy, how ever, warrant s evalua tion for colonic cancer, particular ly in the elder ly.

Hypo albumi-naemia indicate s p oor nutrition al status from a d v a n c e d c a n c e r.

Elevated a l k a l i n e p h o s p h a t a s e - Hepati c Metas tases

Serum lactate dehydrogenase level can be elevated in colonic cancers.

Diarr hoea , N ausea and vomit ing, asso ciated with colonic cancers can produce hypo-volemia, hypo-kalemia, or alkalo sis.

8. **S ERUM CEA :**

CEA (CARCINO EMBRYOGENIC ANTIGEN) is a cell surface glycoprotein discovered by Gold and Freedman .

It is normally produced by colonic epithelium. It's serum half life is upto 10 days and cleared by liver through Kupffer cells.So its half life is prolonged in cholestasis and hepatocellular dysfunction .Most commonly used marker .

Sensitivity of 70% in CRC (<50% in localized disease)

Rising CEA is used as an indicator of disease/ recurrent tumors

Disadvantage is that it is non specific & cannot be used for screening

Normal 0-2.5ng/ml. Benign conditions <10ng/ml

Pre – operative levels > 7.5 ng /ml signifies poor prognosis

Only moderate ly sensi tive

Other conditions like pancreat itis ,obstructive jaundice , hepatitis and benign prostatic hyperplasia also have elevated levels

SCREENING AND SURVEILLANCE FOR COLON CANCER

BENEFITS OF SCREENING :

- Cancer Prevention
- Removal of pre-cancerous polyps prevent cancer
- Improved Survival
- Early detection Improves Long term survival

FAECAL OCCULT BLOOD TESTING (FOBT)

Commonly used test for screening colonic cancers .

It is most commonly tested by a colori-metric assay of a reaction on

Guaiac cataly-zed by the pseudo-peroxidase present in blood.

- Highly insensitive (22%-28%)
- Most FOBT positive cases were found to be due to other causes
- Highly non specific
- Micro – scopic rectal bleeding detected

Stool assay for K-ras, p-53, APC, BAT- 26

Sensitivity of 91% for CRC & specificity of 93%

Other markers :

- CA 19-9
- CA 50

GENETIC MARKERS :

- Mutations in APC gene (5q) .Occur in 80% of FAP cases
- Mutations in MMR in 50% of HNPCC
- 100% accuracy (both positive & negative) if the actual mutation has been identified in the index case
- Used for screening of family members

ANOSCOPY

- Must always be preceded by a DRE.Used as an OP procedure for initial evaluation of a case of bleeding PR.Evaluation of anal and distal rectal lesions

RIGID PROCTOSIGMOIDOSCOPY

- Investigation of choice for distal rectal lesions
- Accurate localization of rectal lesions with regard to site & distance from dentate line
- 25 cm long metal / plastic with fibre optic light source. Enema is not mandatory for the procedure. Perforation is a complication.Very uncomfortable to the patient. Examination is limited to the rectum and very distal part of sigmoid
- Difficult to visualize lesions behind mucosal folds & just inside the anal canal

FLEXIBLE SIGMOIDOSCOPY

- 60 cm long instrument for visualizing sigmoid & descending colon
- Always preceded by an enema
- Air insufflation aids the procedure
- Better optics, flexibility & magnification are the advantages

COLONOSCOPY

- Bowel preparation
- Prophylactic antibiotics
- Sedation & analgesia
- Pt. in left lateral position
- Formation of N & alpha loops are released by torque & jiggling motions
- ***GOLD STANDARD INVESTIGATION*** for patients with suspected colorectal cancer.

COMPLICATIONS

- Perforation in 0.1% of cases
- Hemorrhage in 0.3% to 3% of cases especially after polypectomy
- Bacteremia
- Cardiac arrhythmias in susceptible patients

DCBE (DOUBLE CONTRAST BARIUM ENEMA) :

- Double Contrast Barium Enema another first line investigation in patients with suspected colon cancer.Barium enema followed by air insufflation

  80- 90 % sensitivity in colorectal cancers

- Lesions may be apple core type/ stricture/ polypoid / filling defects type

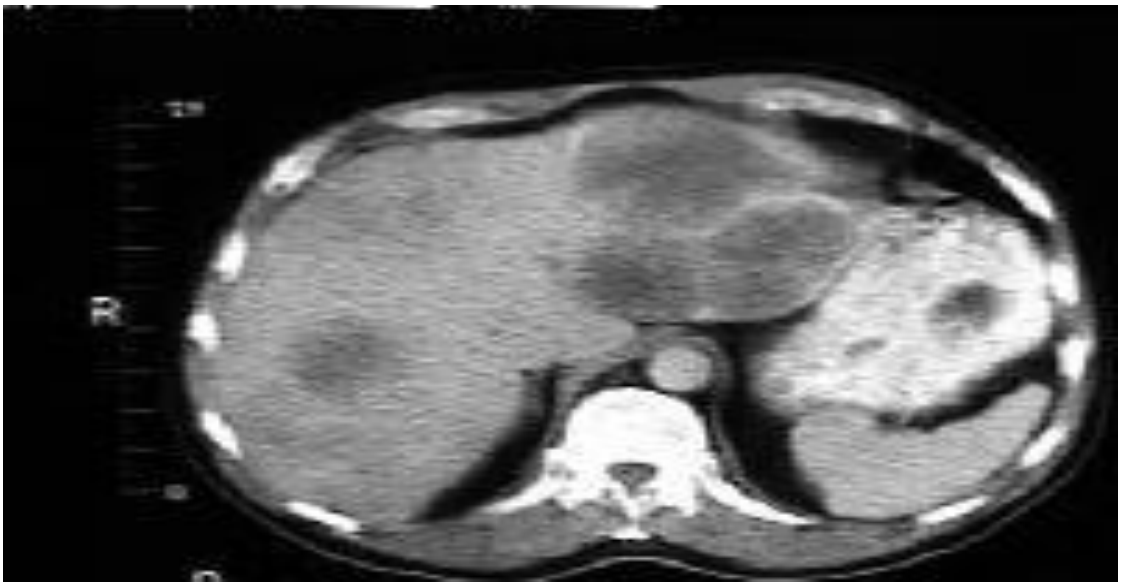
DCBE - APPLE CORE LESION

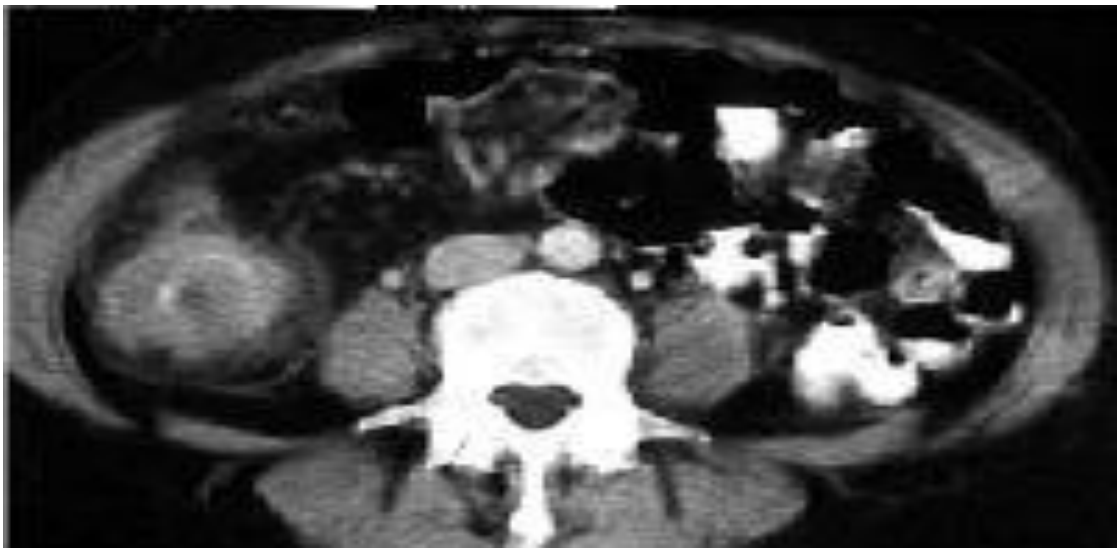
DISADVANTAGES

- Non therapeutic.May miss small flat mucosal lesions. Provides no tissue diagnosis..Spasm of colon can be mistaken for stricture .Lesions in sigmoid especially with diverticulosis can be easily missed
- Rarely perforation can occur

CT ABDOMEN & PELVIS

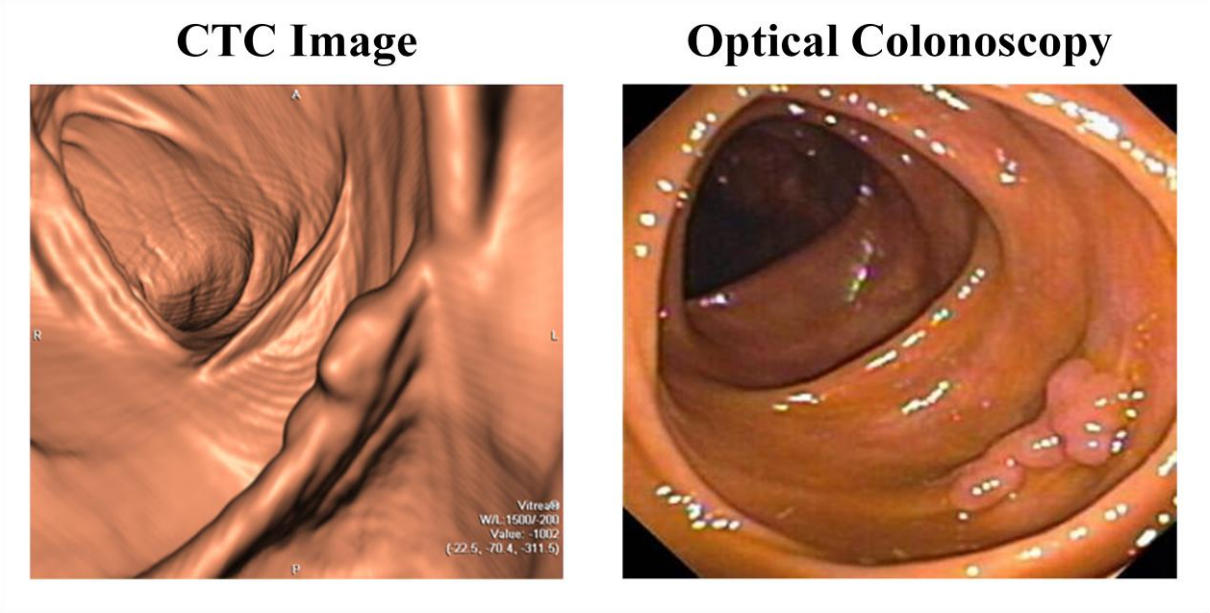
- Pre op staging esp. rectal cancer
- Mainly shows extra luminal spread
- Shows peri rectal invasion & lymph node involvement better then ERUS
- Assessment of liver metastasis
- Post op surveillance





VIRTUAL COLONOSCOPY

- Patient bowel preparation
- Air/ CO 2 insufflation
- Helical CT in prone & supine position
- Sensitivity 83-100% in lesions>1 cm & Specificity 90%



MRI ABDOMEN AND PELVIS :

- Phased array pelvic coils is of great use in rectal & meso rectal lesions. Contrast (super magnetic iron oxide) enhanced MRI is extremely sensitive to detect liver metastases. Main value in pregnancy, fistula & abscesses

NUCLEAR IMAGING

- Indium 111, Iodine 131 & Technetium 99 labeled WBC, RBC or monoclonal antibodies are used
- In^{111} labeled TAG72 antibody is used with greater sensitivity than CT for pelvic tumors & extra hepatic sites
- RIGS (Radio Immuno Guided Surgery) for intra op localization of tumor by gamma camera

ENDO -RECTAL ULTRA SOUND

- Most commonly used investigation for pre op staging of rectal tumors.
- Best mode for local tumor staging. Very useful in tumor recurrences.
- Staples do not interfere with ERUS
- Five layer appearance on US

– Inner white line – balloon mucosa interface
– Inner black line – mucosa & muscularis mucosa
– Middle white line – sub-mucosa
– Outer black line – muscularis propria
– Outer white line – interface with the peri- rectal fat

SCREENING - AMERICAN CANCER SOCIETY GUIDELINES

- **TCE – total colonic examination**
- **Colonoscopy**
- **Simoidoscopy with DCBE**
- **F O B T- Faecal Occult Blood Test**
- **FS – Flexible Sigmoidoscopy**

SURVEILLANCE

- **History**
- **Physical examination**
- **CBC, LFT & LDH**
- **ALL THESE EVERY 3 MONTHS FOR 3 YEARS THEN 6 MONTHS FOR A FURTHER 2 YEARS**

- **Endoscopy +/- CEA +/- CT (High risk patients 6 months after surgery)**
- **Colonoscopy annually for 2-3 years then every 2-3 years thereafter**
- **CEA – sensitivity 80-90% if rising & 60-66% specificity. EVERY MONTH FOR 3 YEARS THEN EVERY 3 MONTHS FOR A FURTHER 2 YEARS**
- **Chest X Ray yearly**

BOWEL PREPARATION

- **Aims**
  - **Purging the faeces**
  - **Reducing the concentration of colonic bacteria**
- **Process**
  - **Diet**
  - **Mechanical preparation**
  - **Antibiotic administration**
- **Diet of clear fluids for 3 days**
- **Mechanical cleansing agents**
  - **PEGLEC**
- 125 mmol Na, 80 mmol sulphate, 35 mmol Cl, 80 mmol PEG
- Dissolved in 2-4 L of water & ingested within 3 hours
- Cramping, nausea, vomiting
- Preferred in patients with ascites, CCF, CRF, cirrhosis
  - **Sodium phosphate (Fleet's Phospho soda)**
- Small volume 45 ml taken twice
- Higher patient compliance
- More chance of electrolyte abnormalities

Antibiotics, :

as elective colorectal cases are of clean contaminated type

Pre op antibiotics parenterally 30 minutes before surgery & repeated every 4 hours if surgery is prolonged. Further post op doses are not beneficial & maybe harmful by promoting *Cl.difficile* colitis, *Candida* infection and resistance. Usually second generation cephalosporins with quinolones and metronidazole are used parenterally

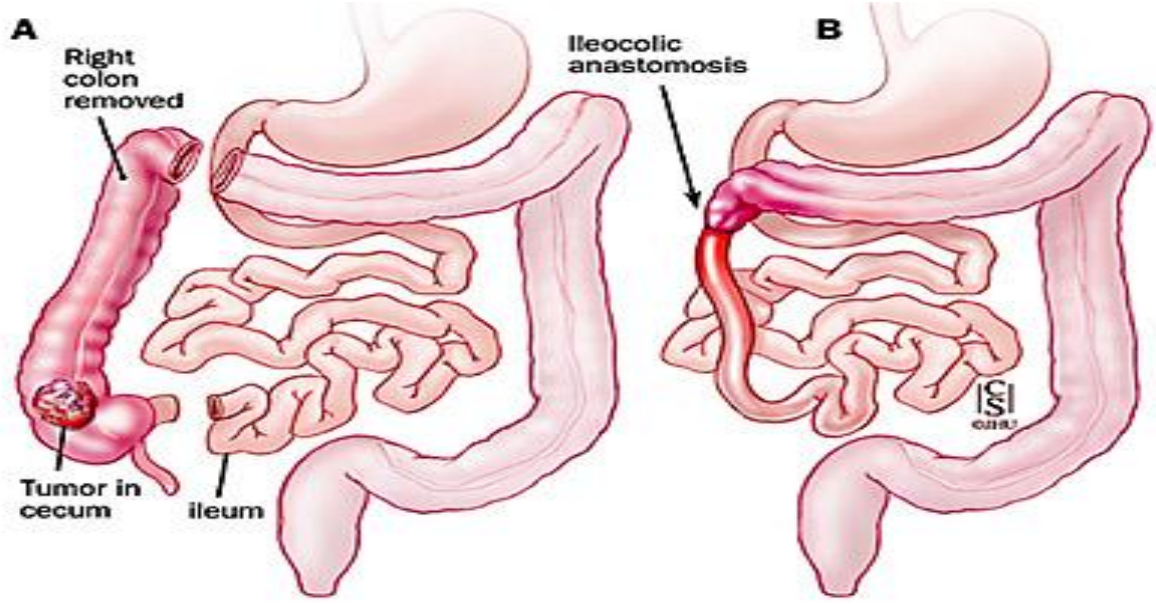
Oral antibiotics erythromycin base 1g and neomycin 1g three doses on the day prior to surgery may also be used

PRINCIPLES OF SURGERY

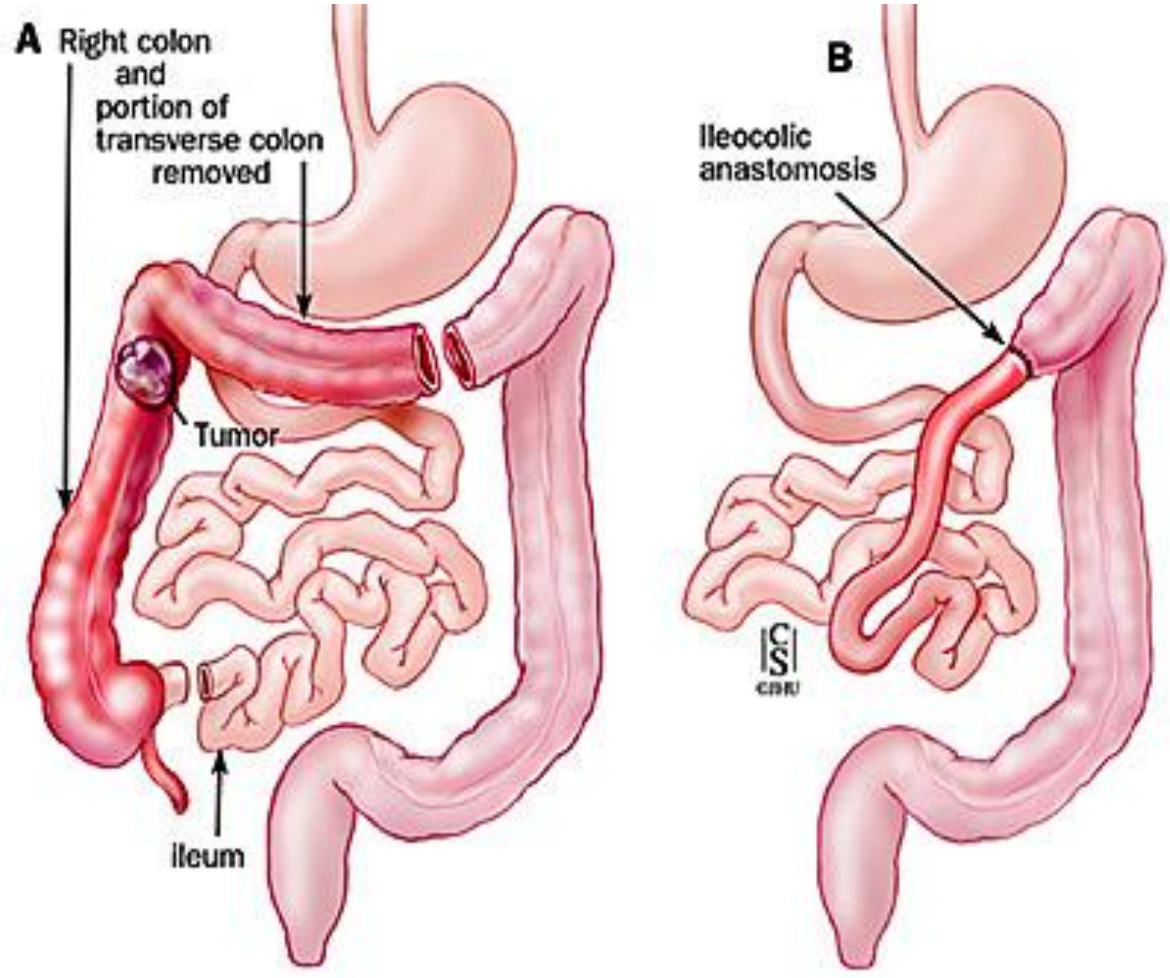
- **Minimal handling of primary**
- **Early proximal ligation of mesenteric vasculature**
- **Proximal and distal luminal occlusion**
- **Application of topical tumoricidal agents**
- **High vascular ligation**
- **Total mesorectal excision**
- **Extended pelvic lymphadenectomy**
- **En bloc resection of any adherent/ invaded tissues**

MANAGEMENT OF COLO – RECTAL CANCERS :

For tumors of Right Colon including Caecum, Ascending Colon, Hepatic Flexure &Proximal HALF OF Transverse Colon–ileo colic, right colic & right branch of middle colic artery are divided and resection of distal 10 cm of ileum, caecum, ascending colon & proximal 1/3 of transverse colon carried out. This is **STANDARD RIGHT HEMICOLECTOMY.**



If the main branch of the MCA divided close to the superior mesenteric vessels – it will increase the length of resection of the transverse colon leaving only its distal third available for anastomosis. This is **Extended Right HEMICOLECTOMY.**

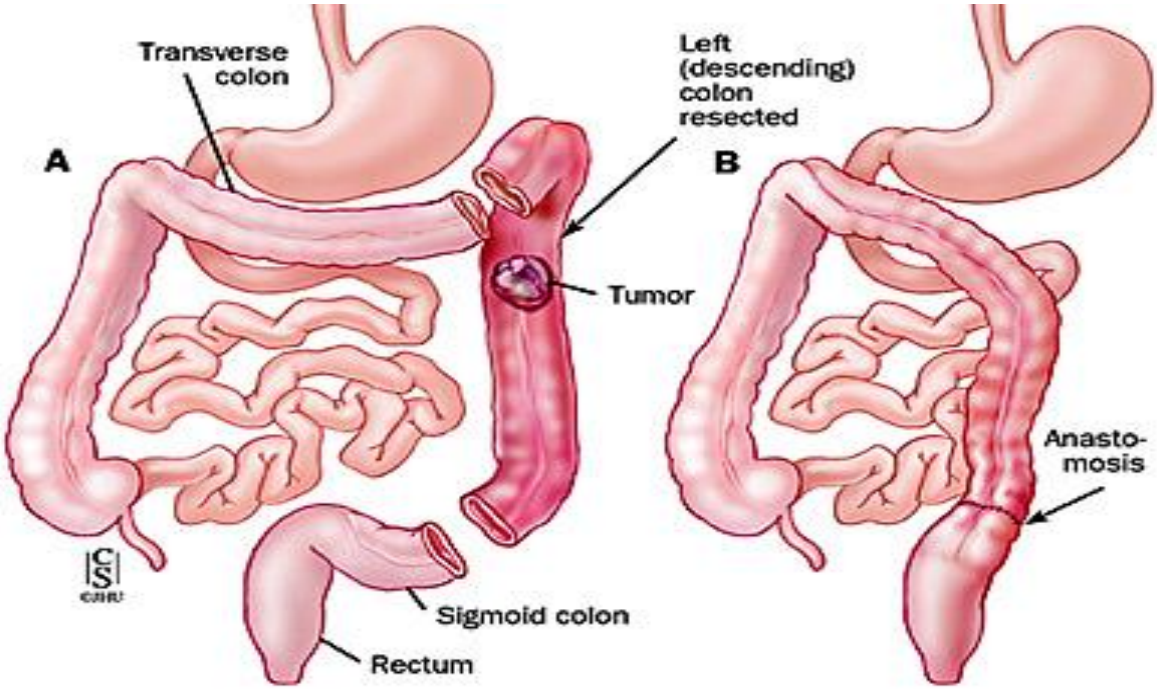


It improves overall 5 yr survival from 55% to 67%.

LEFT HEMICOLECTOMY

- Includes the DISTAL ½ OF TRANSVERSE COLON, SPLENIC FLEXURE, DESCENDING & SIGMOID colon- divide the inferior mesenteric artery as close to the aorta as possible so that the proximal colon is anastomosed to the rectum. This is

LEFT HEMICOLECTOMY.



It relies on an intact marginal art with perfusion of the Left colon based on the Middle Colic Artery.

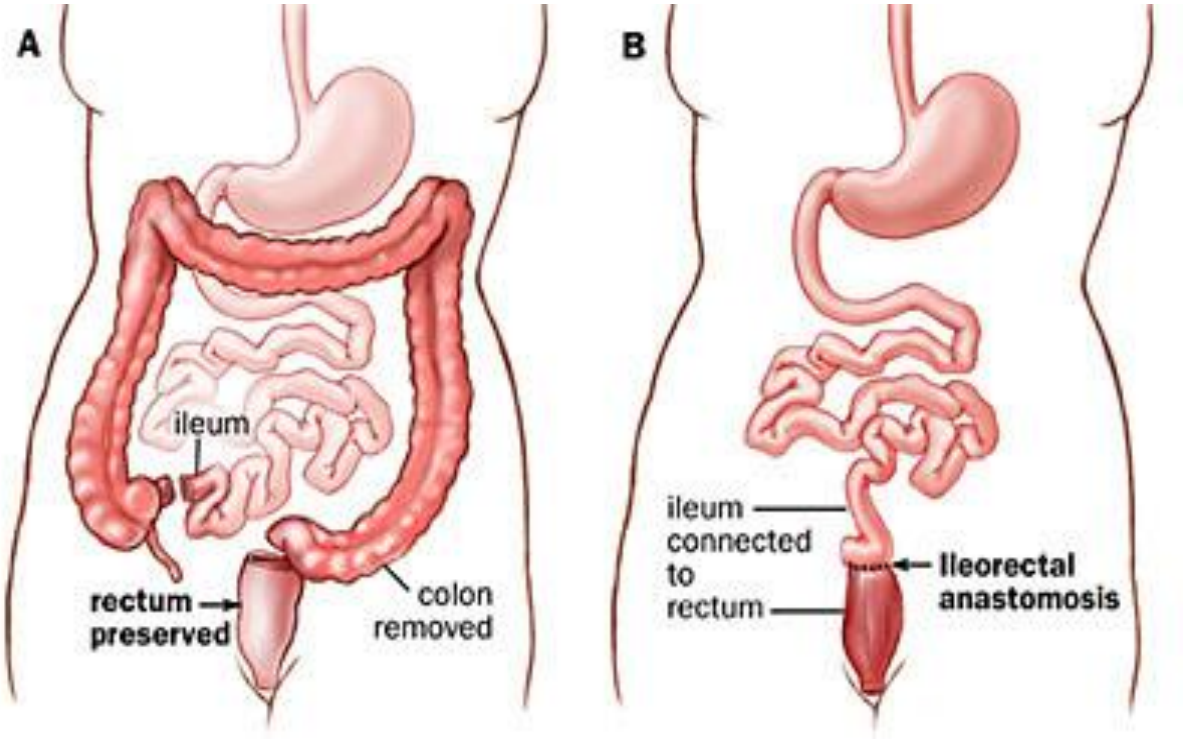
For SIGMOID COLON tumors – divide sigmoid branches of Inferor Mesentric Artery so that the descending colon anastomosed to upper rectum.Removal of colon between the partially retroperitoneal descending colon and rectum

Proximal descending colon to distal sigmoid/rectum

Proximal sigmoid avoided due to

-reduced vascularity from IMA

- higher incidence of diverticular disease



CARCINOMA COLON WITH OBSTRUCTION :

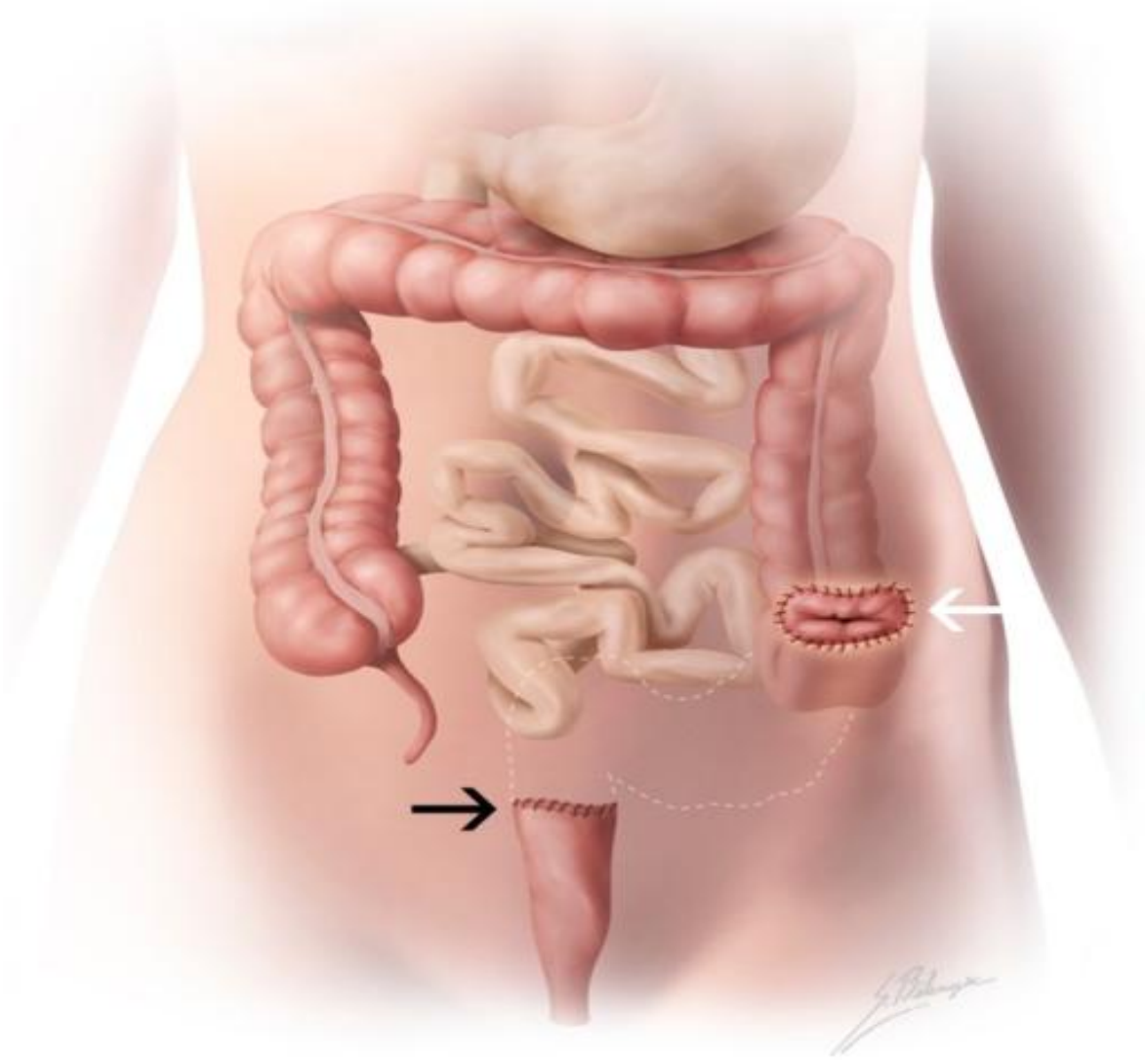
Proximal colon

Right colectomy with ileo-transverse anastamosis

Distal colon

-Hartmann's operation

-for fear of anastamotic site leak & unprepared bowel



ALTERNATIVES TO HARTMAN'S PROCEDURE

Resect the distal colon tumor -> irrigate proximal colon with catheter in appendix/ ileum -> colo –rectal anastomosis

Subtotal colectomy and ileo –sigmoid anastamosis

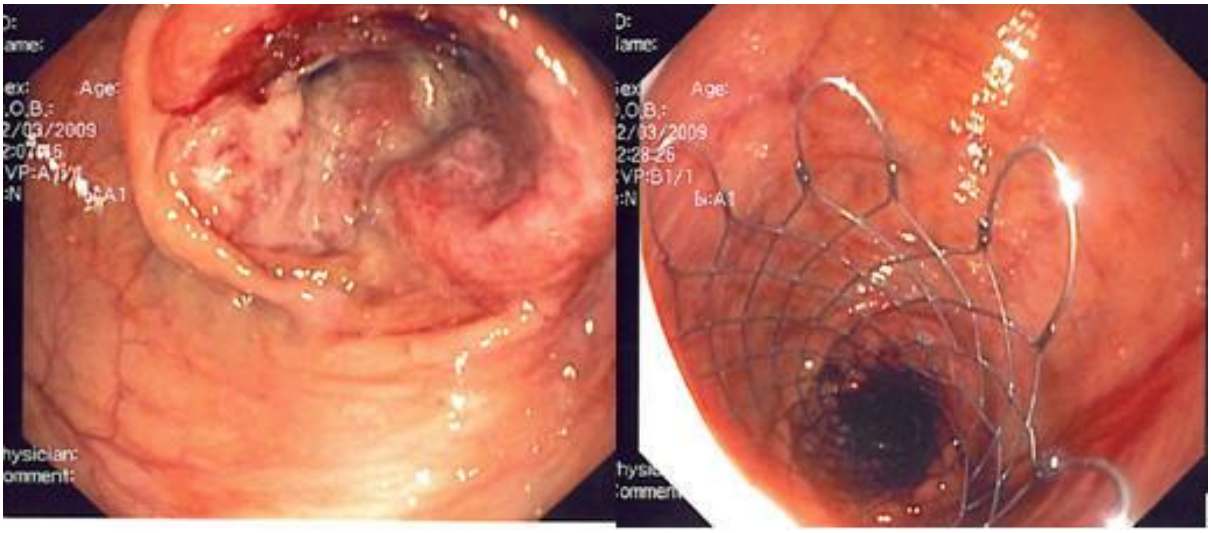
Advantage : avoid colostomy , avoid the need for R/o synchronus lesions

- in sigmoid cancer with obstruction

Disadvantage : - Diarrhoea

ENDOSCOPIC METHODS IN OBSTRUCTION

- Placement of stent SEMS
- Colonoscopy & guide wire that traverse the obstruction used
- Expansion -> lumen creation -> relieve obstruction -> bowel preparation -> elective resection & anastomosis



OBSTRUCTING COLO - RECTAL CANCERS

- Intestinal obstruction- MC emergency presentation of colorectal cancer.
- Poor prognosis associated with this presentation with only 31% survival at 5 yrs.
- Operative mortality- 28%

OPERATIVE PROCEDURES

1. 3 stage operation : Diverting colostomy - resection- colostomy closure

2. Hartmann's procedure

3. Sub total colectomy with ileo rectal anastomosis.

Extended Right colectomy without colonic decompression

Intra operative colonic lavage & segmental resection

4.Radical Right hemicolectomy with primary anastomosis.

PERFORATING COLO – RECTAL CANCERS

- Occur in 2 – 8% of all colorectal cancers.
- Perforation at cancer site 65 – 82% (or) proximally in 18 – 35%
- 1/3 will have metastatic disease, some present with fistula.

  Treatment – Resection *en bloc* with tumor
- Peritoneal seeding with carcinomatosis in 17 – 18 % in perforated colorectal ca.

METHODOLOGY

SOURCE OF DATA :

Data was collected from the patients who got admitted in The Government Rajaji Hospital , Madurai from June 2012 to June 2014,with acute intestinal obstruction perforative peritonitis .

The clinical study of obstructive and perforative colo-rectal carcinomas was conducted by selecting 30 patients , who got admitted in Government Rajaji Hospital , Madurai with Complicated Colo-Rectal Cancer presenting as acute intestinal obstruction and perforative peritonitis from June 2012 to June 2014 .

The institution where the study was conducted was well equipped

to carry out all necessary investigations which helped in

diagnosing and treating the cases .

INCLUSION CRITERIA :

1. Patients admitted with Acute Intestinal Obstruction or Perforative Peritonitis , and who also underwent surgery for the same problem and diagnosed as a case of Complicated Colo –Rectal Cancer were included in this study .

EXCLUSION CRITERIA :

- Patients without surgical management
- Familial polyposis
- Surgery done at an outside hospital
- Ulcerative colitis ,Crohn's disease
- Patients with uncertain clinical diagnosis or insufficient clinical data .

MODE OF SELECTION :

This study included all the patients admitted in general Surgery Wards of Government Rajaji Hospital ,Madurai from June 2012 to June 2014 with acute intestinal obstrsuction and perforative peritonitis and also underwent surgical procedure for the same problem and were diagnosed be cases of Complicated Colo – Rectal Cancer.

Information regarding age , sex , residence , significant Illness , physiologic status , risk factors , indications of surgery , tumour location , type of operation and tumour stage was recorded .All the data collected were retrospectively reviewed .

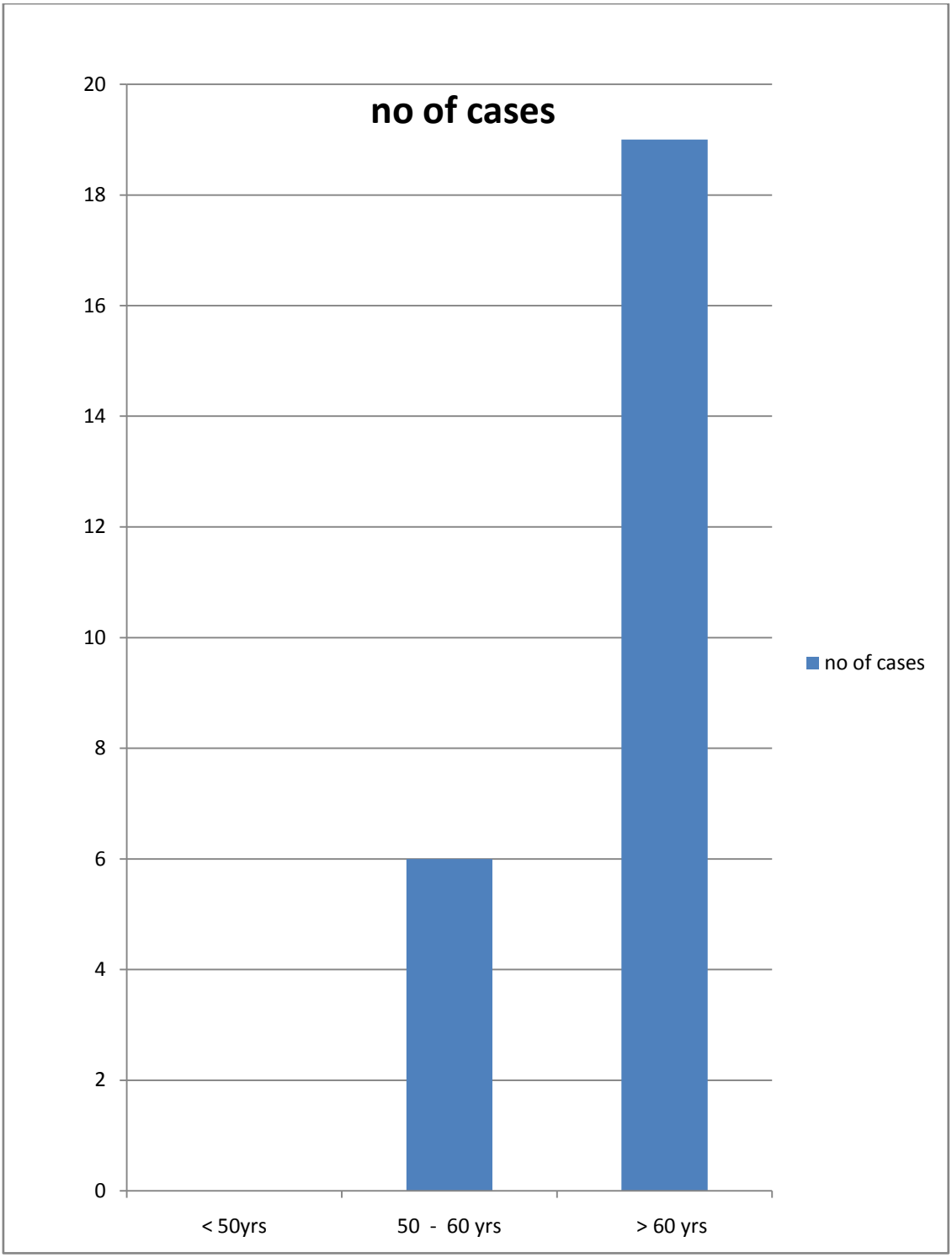
RESULTS

AGE DISTRIBUTION

TABLE 1 :

In this study of 30 patients ,80 % (24 patients) of them were found to be in the age group of more than 60 years .20 % patients (6 patients)were found to be between 50 – 60 years of age , indicating that colo –rectal carcinoma with complications is more common in elder individuals.

AGE IN YEARS	NO OF PATIENTS	PERCENTAGE
< 50 YEARS	—	—
50- 60 YEARS	6	20 %
> 6O YEARS	24	80 %

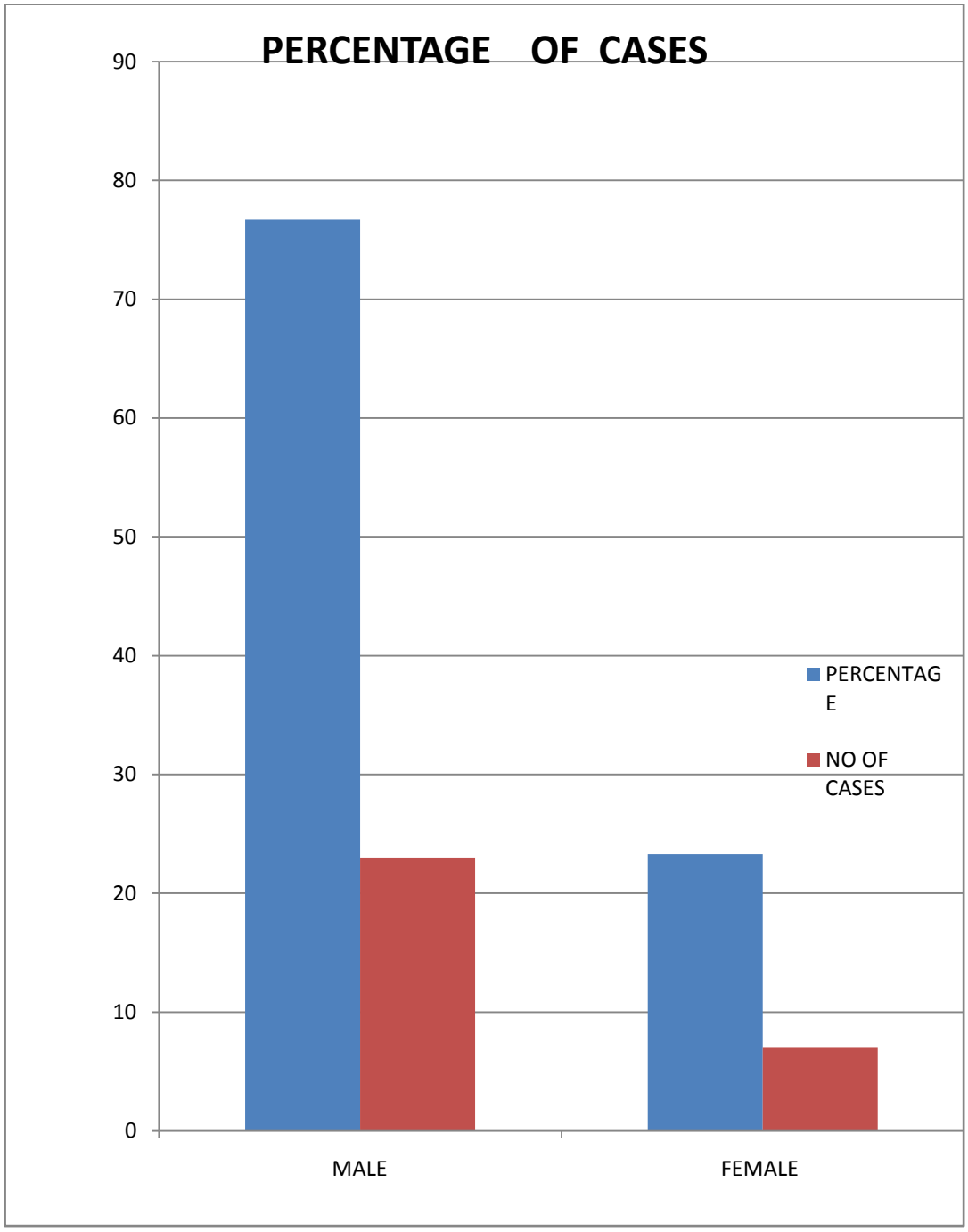


AGE DISTRIBUTION

TABLE 2: SEX INCIDENCE

In this study of 30 patients ,76.7 % (23patients) of them were found to be males . 23.3 % patients (7 patients)were found to be females , indicating that colo –rectal carcinoma with complications is more common in males .

SEX	NO OF CASES	PERCENTAGE
MALE	23	76.7 %
FEMALE	7	23.3 %

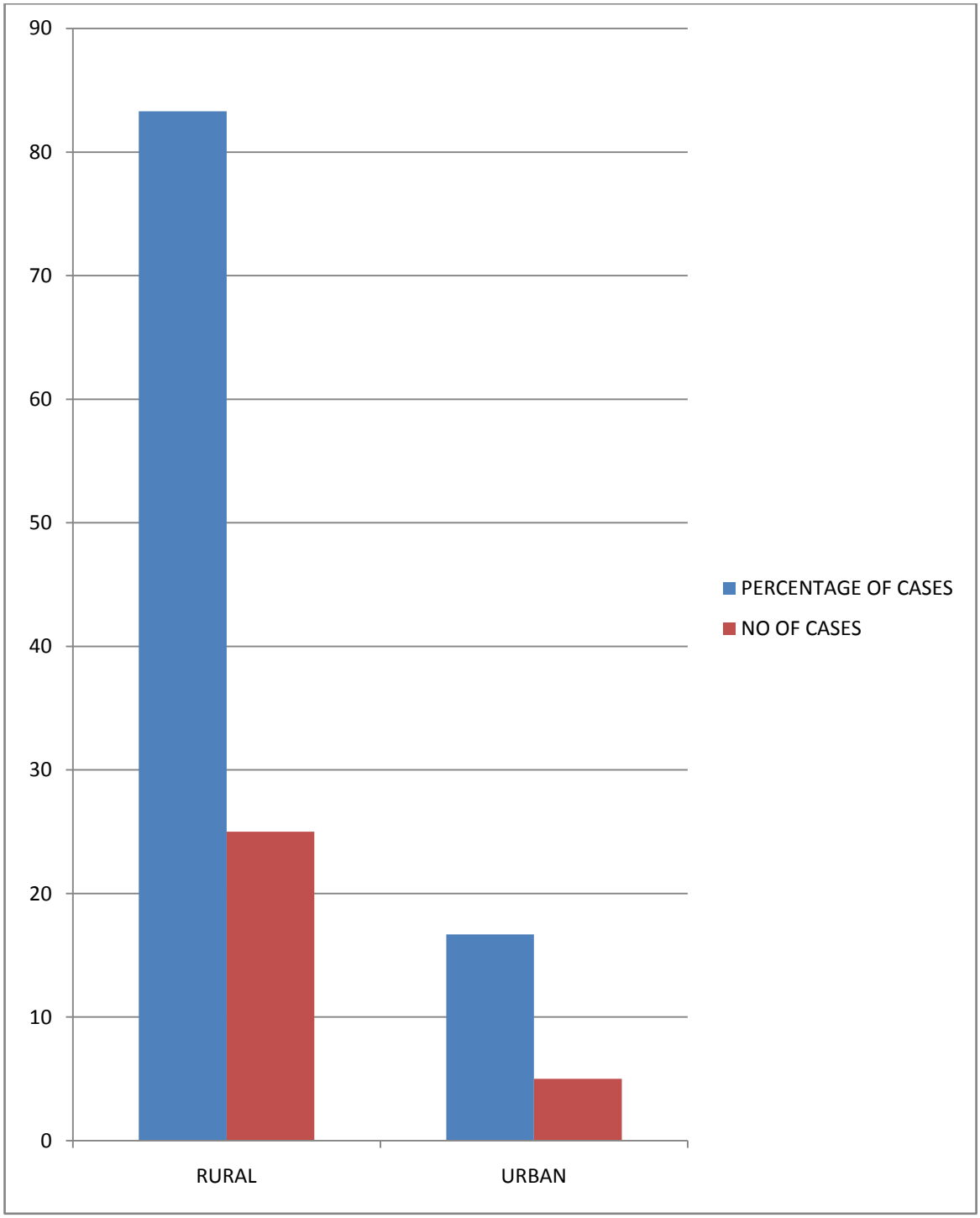


SEX INCIDENCE

TABLE NO :3 RESIDENCE

In this study of 30 patients , 83.3 % (25 patients) of them were found to be from rural areas .16.7 % patients (5 patients)were found from urban areas , indicating that colo –rectal carcinoma with complications is more common in people residing in rural areas .

LOCATION	NO OF CASES	PERCENTAGE
RURAL AREA	25	83.3
URBAN AREA	5	16.7

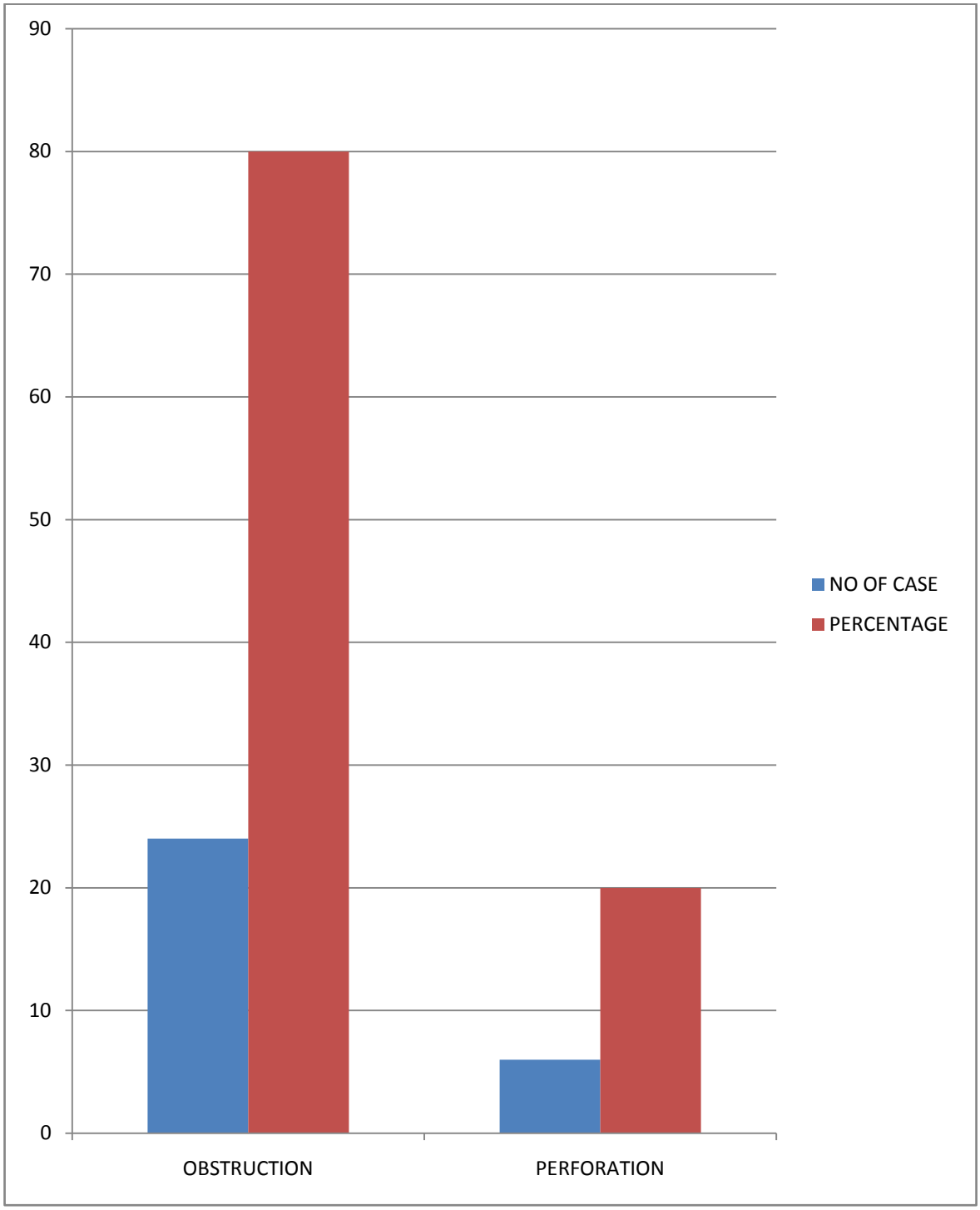

90
80
70
60
50
40
30
20
10
0
RURAL
URBAN
PERCENTAGE OF CASES
NO OF CASES

RESIDENCE

TABLE 4 : MODE OF PRESENTATION

In this study of 30 patients ,80 % (24 patients) of them were found to present with acute intestinal obstruction . 20 % patients (6 patients)were found to present with perforative peritonitis .

PRESENTATION	NO OF CASES	PERCENTAGE
ACUTE INTESTINAL OBSTRUCTION	24	80
PERFORATIVE PERITONITIS	6	20



MODE OF PRESENTATION

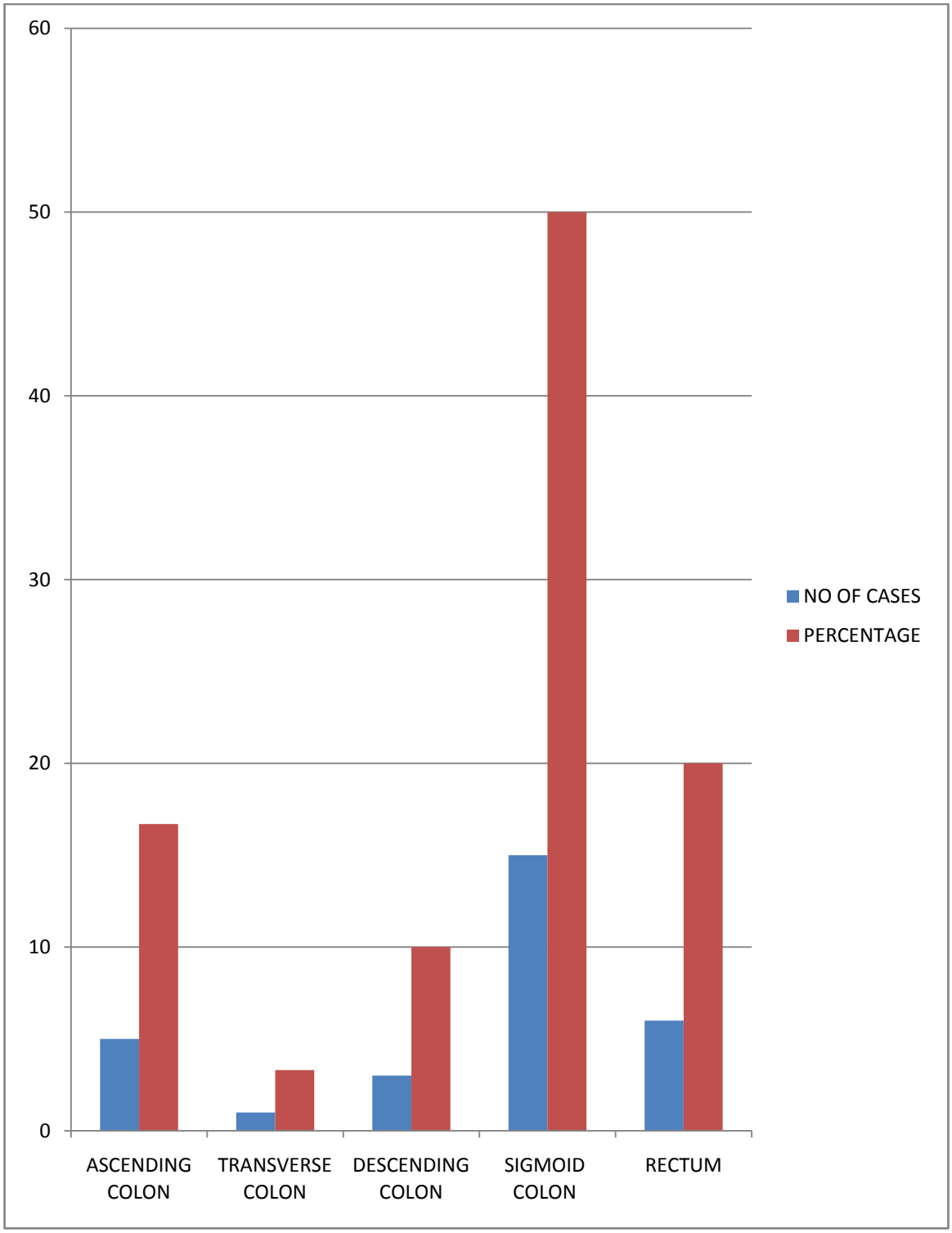
TABLE 5 : LOCATION OF TUMOUR

In this study of 30 patients , 50 % (15 patients) had tumour in sigmoid colon .20 % patients (6 patients) had tumour in rectum .

16.7 % patients had tumour in ascending colon .10 % patients had

Tumour in descending colon , 3.3 % patients had tumour in transverse colon . Sigmoid colon was found to be the most common site of both obstruction and perforation .

SITE	NO OF CASES	PERCENTAGE
ASCENDING COLON	5	16.7
TRANSVERSE COLON	1	3.3
DESCENDING COLON	3	10
SIGMOID COLON	15	50
RECTUM	6	20

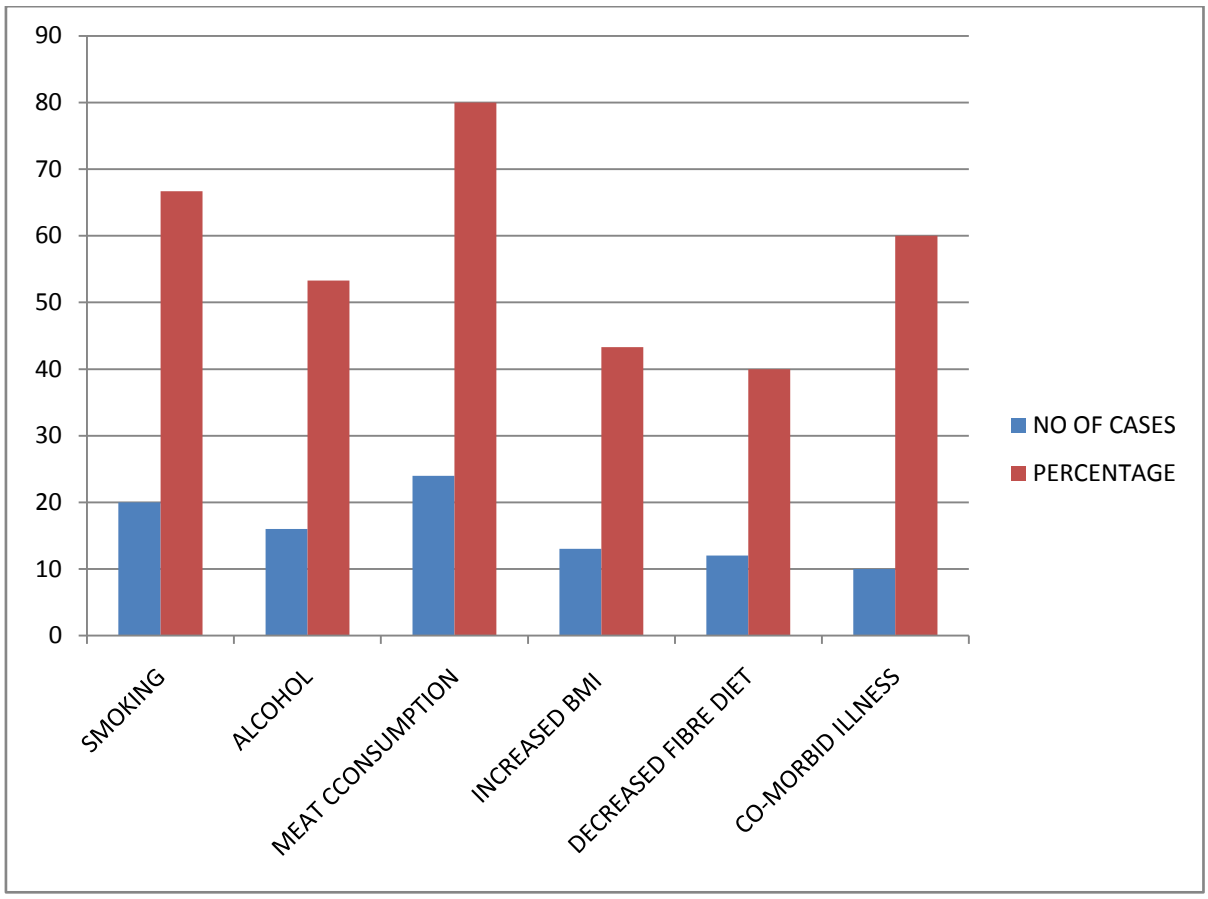


LOCATION OF TUMOUR

TABLE 6 : RISK FACTORS

RISK FACTORS	NO OF CASES	PERCENTAGE
SMOKING	20 /30	66.7
ALCOHOL	16/30	53.3
MEAT CONSUMPTION	24/30	80
INCREASED BMI	13/30	43.3
DECREASED FIBRE DIET	12 / 30	40
CO- MORBID CONDITIONS(DM/HTN/TB /COPD) etc	10/30	33.3

In this study of 30 patients , 40 % patients had decreased intake of dietary fibre , 80 % patients had meat consumption as a risk factor, 33.3 % patients had co- morbid illness , 66.7 % patients had smoking as a risk factor ,increased BMI was noted in 43.3 % patients and 53. 3 % had alchohol consumption as a risk factor. Smoking and alcohol intake was found to be commonly associated with the incidence of colo – rectal cancers .



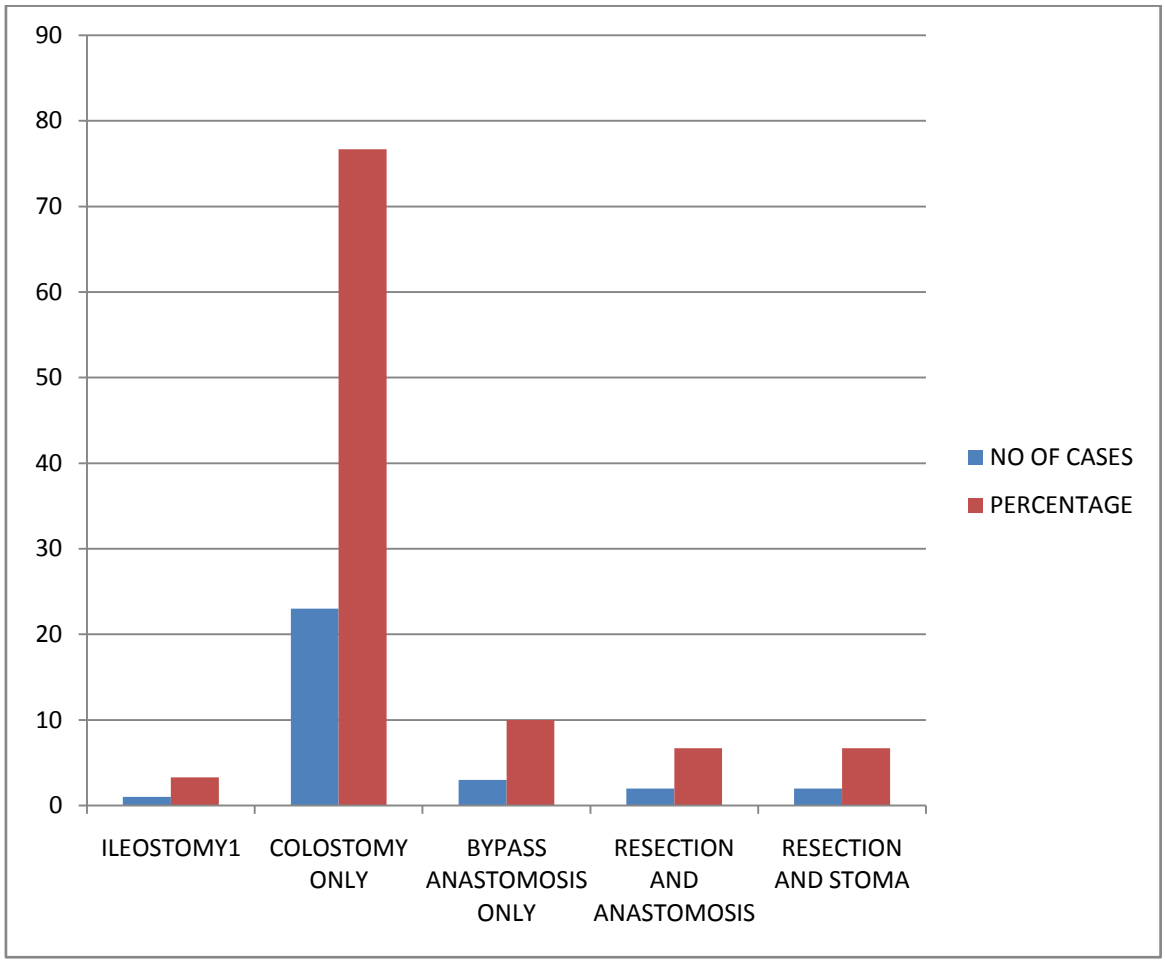
RISK FACTORS

TABLE 7 : PROCEDURE DONE

PROCEDURE DONE	NO OF CASES	PERCENTAGE
ILEOSTOMY ONLY	1	3.3
COLOSTOMY ONLY	23	76.7
BYPASS ANASTOMOSIS ONLY	3	10
RESECTION + ANASTOMOSIS	2	6.7
RESECTION + STOMA	2	6.7

In this study of 30 patients ,in 76.7 % (23 patients) presented as obstruction or perforation , colostomy was the procedure performed .

Anastomosis was done in 10 % (3 patients) presented as acute intestinal obstruction .Resection and anastomosis was done in 6.7 % (2 patients) and resection + stoma was done in 6.7 % (2 patients) respectively.Colostomy was found to be the most commonly performed procedure .Ileostomy was done for a case of caecal perforation.

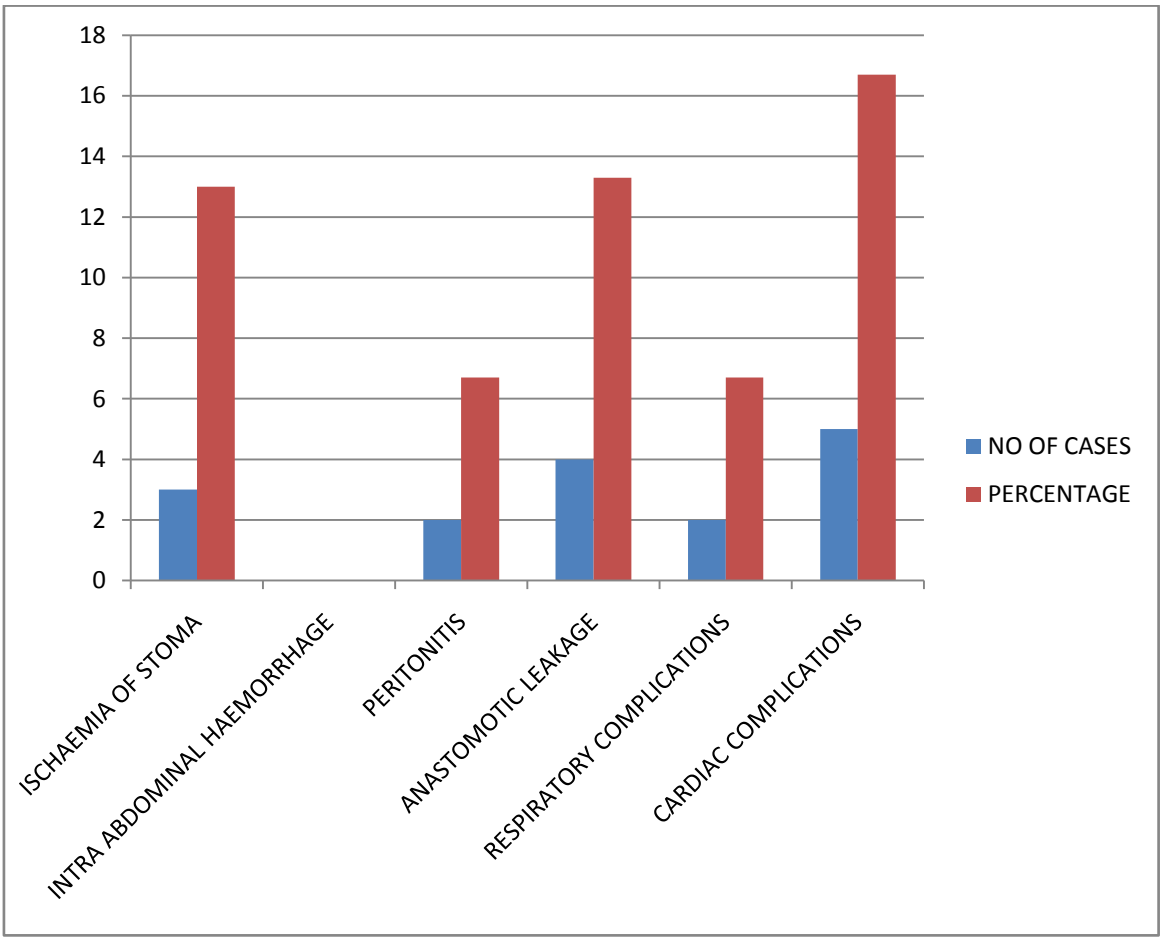


PROCEDURE DONE

TABLE 8 : POST –OPERATIVE COMPLICATIONS

COMPLICATIONS	NO OF CASES	PERCENTAGE
ISCHAEMIA OF STOMA	3	13
INTRA-ABDOMINAL HEMORRHAGE	0	0
PERITONITIS	2	6.7
PROLONGED ILEUS	4	13.3
ANASTOMOTIC LEAKAGE	2	6.7
RESPIRATORY COMPLICATIONS	6	20
CARDIAC COMPLICATIONS	5	16.7
RENAL FAILURE	10	33.3

In this study of 30 patients ,(33.3 %) 10patients had renal failure as the major complication followed by respiratory complications (20 %)6 patients ,Cardiac complications (16.7 %)5 patients ,prolonged ileus was noted in (4 %) 4 patients , ,ischaemia of stoma was noted in (13 %) 3 patients, and ,anastomotic leakage was seen in (6.7 %) 2 patients .6 patients died due to sepsis and renal failure .



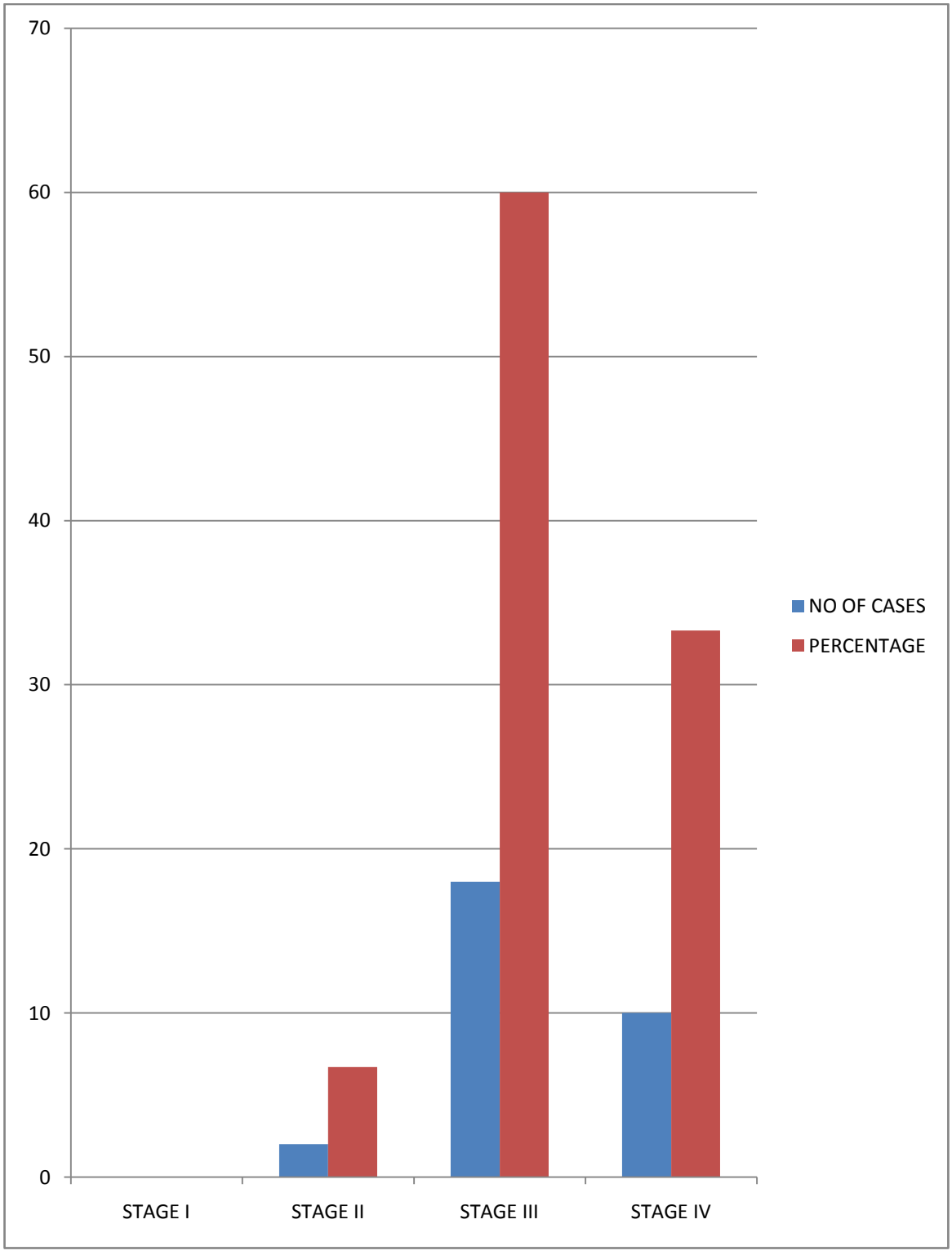
POST - OPERATIVE COMPLICATIONS

TABLE 9 :PATHOLOGICAL STAGING

In this study of 30 patients ,majority of patients were found to have advanced tumour stage III & STAGE IV (93.3 %) -28 patients had advanced lesion. Remaining 6.7 % had stage II tumour .Patients with advanced tumour stage presented either as obstruction or perforation.

Obstruction was found to be more common in patients presenting with advanced tumours.

PATHOLOGIC STAGING	NO OF CASES	PERCENTAGE
STAGE I	0	0
STAGE II	2	6.7
STAGE III	18	60
STAGE IV	10	33.3



TUMOUR STAGE

DISCUSSION

DISCUSSION

30 cases of complicated colo – rectal carcinoma (presenting as acute intestinal obstruction and perforative peritonitis) have been studied.

Out of 30 patients , 23 patients were male and 7 patients were female . This is compared with the study of J.A.Alvarez.et al (2005).

SEX	ALVAREZ et al	PRESENT STUDY
MALE	65 %	76.7 %
FEMALE	42 %	33.3 %

The incidence of colo –rectal carcinoma is more in males .Colorectal carcinomas presenting as emergencies is also found to be more in males .

AGE DISTRIBUTION :

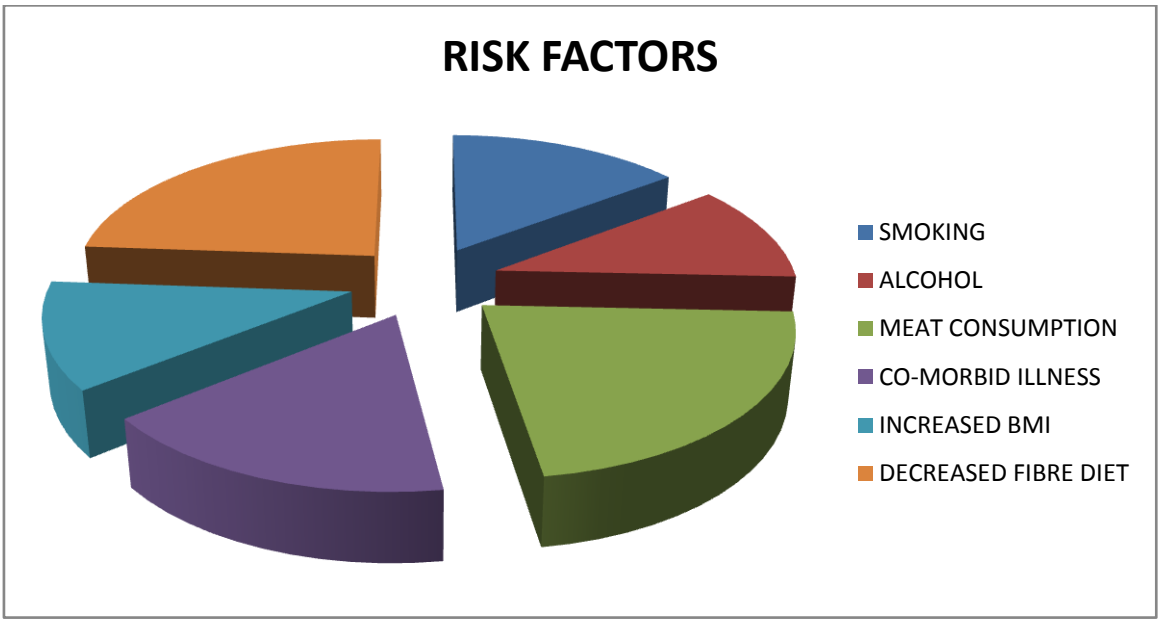
AGE IN YEARS	ALVAREZ et al	PRESENT STUDY
< 60 YRS	-	13.3 %
➢ > 60 YRS	70 %	86.7 %

Colo – rectal cancers presenting as obstruction or perforative peritonitis is found to be more in the elder age group (> 60 years).

86.7 % patients are found to be from this age group .

Older age has been found to have a significant influence on the outcome of patients with colo – rectal cancers .

RISK FACTORS :



In this study of 30 patients ,Smoking (66%),Alcohol intake (53.3 %), Meat consumption(80 %) ,Decreased fibre diet (40%) was noted.

Meat consumption ,Smoking and alcohol were found to be the major risk factors for developing colon cancer.

Among co –morbid illness DM ,COPD and Cardiac problems were found to be more commonly associated .

MODE OF PRESENTATION :

PRESENTATION	ALVAREZ et al	PRESENT STUDY
ACUTE INTESTINAL OBSTRUCTION	78 %	80 %
PERFORATIVE PERITONITIS	22 %	20 %

Most common mode of acute presentation of colo – rectal cancers were found to be Acute Intestinal Obstruction . Obstruction occurred in about 78% of patients , in this study of 30 patients .

Obstruction was also found to be more common in males .Left side colon tumours mostly presented as intestinal obstruction .

TUMOUR LOCATION :

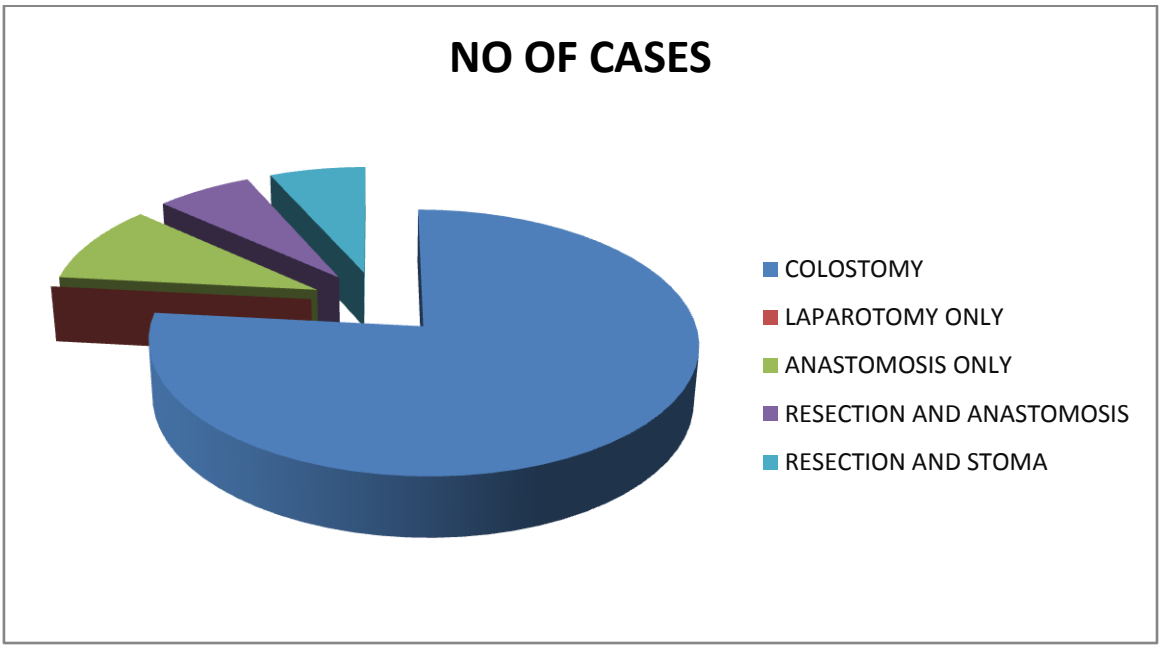
SITE OF TUMOUR	ALVAREZ et al	PRESENT STUDY
RIGHT COLON	25.2 %	20 %
LEFT COLON	74.8 %	80 %

In this study of 30 patients , most common site of tumours were found to be left colon . About 80 % of patients presented with left colon cancers.

In the left colon , Sigmoid colon was found to affected most commonly .Tumours in left colon commonly presented as obstruction.Perforation was also found to be more common in left colon.

Sigmoid colon was found to be the commonest site for perforation

TYPE OF PROCEDURE DONE :



Colostomy was found to be the most commonly performed procedure. Most of the patients had an end colo stomy. Colostmoy was performed in about 76.7 % patients .Patients with perforative cancers ,had an end colo stomy.Patients with obstruction in right colon ,had resection and anastmosis or anastomosis.

A case a caecal perforation was managed by loop ileostomy.

COMPLICATIONS AND OUTCOME :

COMPLICATIONS	ALAVERZ et al	PRESENT STUDY
ISCHAEMIA OF STOMA	5.67 %	6.7 %
PERITONITIS/ INTRA ABDOMINAL ABSCESS	4.67 %	16.7 %
PROLONGED ILEUS	3.7 %	10 %
ANATOMOTIC LEAKAGE	1.8 %	10 %
RESPIRATORY COMPLICATIONS	11.2 %	53.3 %
CARDIAC COMPLICATIONS	2.8 %	10 %
RENAL FAILURE	9.3 %	46.7 %
DEATH	15 %	20 %

Post – operative complications occurred in 24 patients (80 %) and major complications were noted in 13 patients (43.3 %). Major complications were found to be renal , cardiac ,respiratory and gastro intestinal problems .Minor complications were found to be urinary tract infections , wound infections and wound dehiscence .10 patients developed wound infection ,5 patients developed urinary tract infections ,3 patients developed wound dehiscence .6 patients (20%) died , of whom 3 had perforation and 3 had obstruction .The mortality rates for obstructing lesions were found 10 % and for perforative lesions were found 10% .The causes for death were 1.) SEPSIS

2.)Renal failure 3.) Respiratory failure .All the deaths after surgery for perforated cancer were due to sepsis .Multi organ failure was the main cause of death in patients treated for obstruction and in patients with advanced disease with metastases .

Analysis revealed that older age , presence of perforation proximal to the cancer and poor physiological status had significant influence on the risk of major complications.

SUMMARY

SUMMARY

COLORECTAL CARCINOMA oocurs most commonly in males , when compared to females . COMPLICATED COLORECTAL CARCINOMA (CRC with obstruction and perforation) is also found to be more common in males .

Meat consumption , smoking and alcohol were found to be major risk factors associated with incidence of colo – rectal cancers .

The incidence of obstruction and perforation in colorectal carcinoma is found to be more common in elder age group (age > 60 years).All the affected individuals are found to be mostly residing in rural areas .

The common mode of presentation of complicated colo rectal cancers is found to be acute intestinal obstruction (80 %) .The most common site of location of the tumour is found to be sigmoid colon .

Perforation is also very common in the site proximal to the tumour in sigmoid colon .Obstruction and perforation were found to be more common in left side colonic cancers .Sigmoid colon was also found to be the most common site for perforation .

For colonic cancers presenting with obstructing and perforative peritonitis , Colostomy was found to be the most commonly performed procedure. .Due to Unprepared bowel and poor general condition of patient , resection and anastomosis was not commonly performed .For obstructive cancers mostly resection and primary anastomosis was performed.

Acute presentations of colo –rectal cancers were most commonly found in patients with advanced disease (stage III & stage IV).Co-morbid illness like Diabetes ,Hypertension ,COPD and Renal problems were found to have influence on the outcome of patients with colo – rectal cancers.

Most common major complications were found to be sepsis , muti organ failure and respiratory failure . Above given complications were major reasons for the moratility of the patients .

Among the patients who underwent surgery ,few minor complications occurred, among which more common was abdominal wound infections and wound dehiscence.

CONCLUSION

- Complicated colo – rectal cancers presenting as acute obstruction or perforative peritonitis is most common in males.Perforative colo-rectal cancers are more common in females .

-Common age group affected is > 6o years of age .

- Most of the patients presenting as acute emergencies are from rural areas .

- Complicated colo –rectal cancers are most commonly associated with smoking ,alcohol intake , meat consumption .These factors are found to be present in patients presenting with advanced diease with complications.

- Complicated colo – rectal cancers most commonly present as acute intestinal obstruction.

- Left colon , more commonly sigmoid colon is found be affected in both obstructive and perforative colo – rectal cancers .

- Majority of the patients are found to have advanced tumour (STAGE III & STAGE IV)

-Colostomy is the most commonly performed procedure .

-Sepsis , renal and respiratory problems are the major complications responsible for morbidity and mortality.

ANNEXURES

BIBILIOGRAPHY ;

References

1.Runkel NS, Hinz U, Lehnert T, et al. Improvement outcome after emergency surgery for cancer of the large intestine. Br J Surg 1998; 85:1260 –5.

2. Umpleby HC, Williamsom RC. Survival in acute obstructing colo-rectal carcinoma. Dis Colon Rectum 1984;27:299 –304.

3. Ohman U. Prognosis in patients with obstructing colorectal carci-noma. Am J Surg 1982;143:742–7.

4.Phillips RK, Hittinger R, Fry JS, et al. Malignant large bowel ob-struction. Br J Surg 1985;72:296 –302.

5.Crowder VH Jr, Cohn I Jr. Perforation in cancer of the colon and rectum. Dis Colon Rectum 1967;10:415–20.

6.Mandawa N, Kumar S, Pizzi WF, et al. Perforated colorectal carci-nomas. Am J Surg 1996;172:236 – 8.

7.García-Valdecasas JC, Llovera JM, de Lacy AM, et al. Obstructing colorectal carcinomas. Prospective study. Dis Colon Rectum 2001; 34:759 – 62.

8.Kriwanek S, Armbruster C, Dittrich K, et al. Perforated colorectal cancer. Dis Colon Rectum 1996;39:1409 –14.

9.Wang HS, Lin JK, Mou CY, et al. Long-term prognosis of patients with obstructing carcinoma of the right colon. Am J Surg 2004;187: 497–500.

10.Owens WD, Felts JA, Spitznagel EL Jr. ASA Physical Status Classifications: a study of consistency of ratings. Anesthesiology 1978; 49:239 – 43.

11.Knaus WA, Draper EA, Wagner DP, et al. APACHE II: a severity of disease classification. Crit Care Med 1985;13:818 –29.

12 .Dukes C. The classification of cancer of the rectum. J Pathol Bacteriol 1932;35:323–32.

13. Kyllönen LEJ. Obstruction and perforation complicating colorectal carcinoma: an epidemiologic and clinical study with special reference to incidence and survival. Acta Chir Scand 1987;153:607–14.

14.Fielding LP, Stewart-Brown S, Blesovsky L. Large bowel obstruction caused by cancer: a prospective study. Br Med J 1979;2:515–7.

15.Runkel NS, Schlag P, Schwarz V, et al. Outcome after emergency surgery for cancer of the large intestine. Br J Surg 1991;78:183– 8.

16.Chen HS, Sheen-Chen SM. Obstruction and perforation in colorectal adenocarcinoma: an analysis of prognosis and current trends. Surgery 2000;127:370 – 6.

17.Serpell JW, Mc Dermott FT, Katrivessis H, et al. Obstructing carci-nomas of the colon. Br J Surg 1989;76:965–9.

18.Buechter KJ, Boustany C, Caillouette R, et al. Surgical management of the

acutely obstructed colon. Am J Surg 1988;156:163– 8.

19.Papachristodoulou A, Zografos G, Markopoulos C, et al. Obstructive colonic cancer. J R Coll Surg Edinb 1993;38:296 – 8.

20.Smothers L, Hynan L, Fleming J, et al. Emergency surgery for colon carcinoma. Dis Colon Rectum 2003;46:24 –30.

21.Kaufman Z, Eiltch E, Dinbar A. Completely obstructive colorectal cancer. J Surg Oncol 1989;41:230 –5.

22.Arveux I, Boutron MC, El Mrini T, et al. Colon cancer in the elderly: evidence for major improvements in health care and survival. Br J Cancer 1997;76:963–7.

23.Kingston RD, Jeacock J, Walsh S, et al. The outcome of surgery for colorectal cancer in the elderly: a 12-year review from the Trafford database. Eur J Surg Oncol 1995;21:514 – 6.

24.Campbell NC, Elliot AM, Sharp L, et al. Rural and urban differences in stage at diagnosis of colorectal and lung cancers. Br J Cancer 2001;84:910 – 4.

25.Leitman IM, Sullivan JD, Brams D, et al. Multivariate analysis of morbidity and mortality from the initial surgical management of obstructing carcinoma of the colon. Surg Gynecol Obstet 1992;174: 513– 8.

26.Willett C, Tepper JE, Cohen A, et al. Obstructive and perforative colonic carcinoma: patterns of failure. J Clin Oncol 1985;3:379 – 84.

27.Griffin MR, Bergstralh EJ, Coffey RJ, et al. Predictors of survival after

curative resection of carcinoma of the colon and rectum. Cancer 1987;60:2318 –24.

28.Payne JE, Meyer HJ. Independently predictive prognostic variables after resection for colorectal carcinoma. Aust N Z J Surg 1997;67: 849 –53.

29.Biondo S, Ramos E, Deiros M, et al. Prognostic factors for mortality in left colonic peritonitis: a new scoring system. J Am Coll Surg 2000;191:635–42.

30.Tobaruela E, Camuñas J, Enríquez-Navascués JM, et al. Factores médicos en la morbimortalidad de la cirugía urgente por cáncer colorrectal. Rev Esp Enf Digest 1997;89:13–7.

31.Houbiers JG, van de Velde CJ, van de Watering LM, et al. Transfu-sion of red cells is associated with increased incidence of bacterial infection after colorectal surgery: a prospective study. Transfusion 1997;37:126 –34.

32.Leal Noval SR, Jara López I. Do multiple blood transfusions predis-pose for a higher rate of non-blood-related infection complications? Clin Microbiol Infect 2002;8:383–7.

PROFORMA

CASE NUMBER:

ADDRESS:

NAME AGE SEX

IP NUMBER: WARD

RELIGION: OCCUPATION:

DOA:

DOS: DOD:

HISTORY

Chief Complaints

- Abdominal pain
- Nausea and vomiting
- Abdominal distension
- Passing blood in stool

- Altered bowel habits
- Loss of weight and loss of appetite
- Constipation
- Fever
- Not passing flatus

History of presenting illness

- **Abdominal pain**

- Site
- Character
- Time of onset
- Duration
- Symptom free interval
- Radiation
- Aggravating factors
- Relieving factors
- Relation to food

Vomiting

- Onset
- Frequency
- Projectile/Effortless
- Quantity
- Colour
- Contents
- Odour
- Relieving factors
- Relation to food

Past history

Personal history

- Diet
- Sleep
- Addictive habits

Menstrual and Obstetric history

Menarche

- Amenorrhea
- Relation to pain

- EXAMINATION

  General physical examination

- Pallor
- Icterus
- Cyanosis
- Vital signs:
- Pulse rate:
- Blood pressure

  Abdominal examination

➢ **Inspection**

- Shape - Scaphoid / Distended
- Movement with respiration
- Dilated veins
- Scars/ Sinus
- Hernial orifices - Free / Full
- Umbilicus - Central / Displaced
- External genitalia

Palpation

- Local rise of temperature
- Tenderness
- Rebound tenderness
- Rigidity
- Guarding
- Mass
  - Site
  - Shape
  - Plane - Intra / Extra peritoneal
  - Consistency - Soft / Firm / Hard
  - Borders
  - Pulsations
  - Size
  - Surface – Smooth/Nodular
  - Movement – Mobile/Fixed
  - Continuity with liver

Percussion

- Liver span
- Note over mass - Resonant / Impaired / Dull
- Movement - Mobile / Fixed

- **Auscultation**

- Bowel sounds - Normal / Increased / Decreased / Absent
- Additional sounds - Present / Absent

- **Rectal Examination :** Normal / Abnormal

Cardiovascular system - Normal / Abnormal

Respiratory system - Normal / Abnormal

Central nervous system - Normal / Abnormal

INVESTIGATIONS

- Haemoglobin:
- Total Count
- Bleeding time ,Clotting time :
- Blood Urea
- Serum creatinine
- Blood Sugar (Fasting/Random)
- Urine routine: Normal/ Abnormal
- Liver function tests

✓ Total bilirubin:

- ✓ SGOT:
- ✓ Total protein:
- ✓ Globulin:
- ✓ Alkaline phosphatase:

- Chest x-ray PA view :
- Plain x- ray Abdomen erect :
- Emergency Ultra sonogram :
- Indication for surgery :
- Tumor location :
- Tumor stage :
- Type of operation :
- Post operative HPE report :

MASTER CHART

Name	Age	Sex	Residence	Risk Factors	Tumour location	Indication For surgery	Procedure done	Major complications	Minor complications
Karuppaih IP.NO.12396	70	M	rural	+	Sig. colon	Perf-oration	C	+++	++
Vellaiammal IP.NO.26119	63	F	rural	+	Sig. colon	Obstr-uction	C	+	+
Malaiswamy IP.NO: 28342	62	M	rural	+	Sig. colon	Obstr-uction	C	++	++
Chinnadurai IP.NO.33221	56	M	rural	-	Sig. colon	Obstr-uction	C	+	++
Devaraj IP.NO.35642	58	M	urban	+	Asc .colon	Obstr-uction	R +A	+	+ ++
Backiyam IP.NO.38501	66	M	rural	+	Dec Colon	Perf-oration	C	+++	+
Visikkiyammal IP.NO.22342	68	F	rural	-	Rectum	Obstr-uction	C	++	+++
Ambalam IP.NO.26543	65	M	rural	+	Tran.colon	Obstr-uction	I	++	++
Pandi IP.NO.22105	63	M	rural	+	Sig. colon	Obstr-uction	C	+	++
Gunasekaran IP.NO.24471	57	M	urban	+	Sig. colon	Obstr-uction	C	++	+
Pachaimuthu IP.NO.45212	65	M	rural	+	Asc. colon	Obstr-uction	IT	+++	++
Chitravel IP.NO.41941	67	M	rural	+	Sig. colon	Perf-oration	C	+++	++
Malarkkannan IP.NO.40837	58	M	urban	_	Sig. colon	Obstr-uction	C	++	+
Ramaswamy IP.NO.32371	63	M	rural	+	Sig. colon	Obstr-uction	C	+	+

Mookammal IP.NO.54270	**62**	**F**	**rural**	**-**	**Rec**	**Obstr-uction**	**C**	**+++**	**++**
Sudalaiyandi IP.NO.53412	**68**	**M**	**rural**	**+**	**Sig. colon**	**Obstr-uction**	**R +S**	**+++**	**+++**
Arumugam IP.NO.52208	**61**	**M**	**rural**	**+**	**Rec**	**Perf-oration**	**C**	**+++**	**+++**
Pappa IP.NO.51126	**65**	**F**	**rural**	**-**	**Sig. colon**	**Perf-oration**	**C**	**+++**	**+++**
Veluswamy IP.NO.507	**62**	**M**	**rural**	**+**	**Sig. colo**	**Obstructio n**	**C**	**++**	**++**
Muthuraman IP.NO.47305	**64**	**M**	**rural**	**-**	**Asc. colon**	**Obstr-uction**	**IT**	**+++**	**++**
Selvasigamani IP.NO.26671	**66**	**M**	**urban**	**+**	**Sig. colon**	**Obstr-uction**	**R +S**	**++**	**++**
Paraman IP.NO.29875	**56**	**M**	**rural**	**+**	**Asc. colon**	**Obstr-uction**	**R +A**	**+++**	**+++**
Podhum ponnu IP.NO.54822	**64**	**F**	**rural**	**-**	**Sig. colon**	**Obstr-uction**	**C**	**+++**	**+**
Mazhuvu IP.NO.57721	**66**	**M**	**rural**	**+**	**Rec**	**Obstr-uction**	**C**	**++**	**++**
Muthulakshmi IP.NO.60042	**59**	**F**	**rural**	**-**	**Sig. colon**	**Obstr-uction**	**C**	**++**	**++**
Rajendran IP.NO.62503	**63**	**M**	**rural**	**+**	**Rec**	**Obstr-uction**	**C**	**+++**	**+**
Vendhan IP.NO.32219	**60**	**M**	**urban**	**+**	**Rec**	**Obstr-uction**	**C**	**+**	**++**
Murugesan IP.NO.71811	**67**	**M**	**rural**	**+**	**Sig. colon**	**Perf-oration**	**C**	**+++**	**++**
Suthanthiram IP.NO.73128	**60**	**F**	**rural**	**-**	**Asc. colon**	**Obstr-uction**	**IT**	**++**	**++**

KEY TO MASTER CHART :

Sig.colon - SIGMOID COLON

Asc .colon - ASCENDING COLON

Desc .colon – DESCENDING COLON

Rec - REECTUM

Tran.colon - TRANSVERSE COLON

C - COLOSTOMY

R + A - RESECTION + ANASTOMOSIS

I T - ILEO TRANSVERSE ANASTOMOSIS

R + S - RESECTION + STOMA

I - ILEOSTOMY

MAJOR COMPLICATIONS :

+ = SEPSIS

++ = SEPSIS + RENAL FAILURE

+++ = MORE THAN 2 MAJOR COMPLICATIONS

MINOR COMPLICATIONS :

+ = WOUND INFECTION

++ = WOUND DEHISCENCE

+++ = MORE THAN 2 MINOR COMPLICATIONS

CONSENT FORM FOR SURGERY AND ANAESTHESIA

I _____ Hospital .No. _____ in my full Senses hereby give my complete consent for _____ or any other procedure deemed fit which is a diagnostic / therapeutic procedure/ surgery to be performed on me / my son / my daughter / my wife ,_____ age , under any anaesthesia deemed fit . The nature and risks involved in the procedure have been explained to me in my own language to my satisfaction .For academic and scientific purpose , the surgery / procedure may be photographed or recorded and or used for statistical measurements .

DATE : Signature / Thumb Impression

PLACE : of the patient or guardian

ABBREVIATIONS :

Antr - ANTERIOR

Postr – POSTERIOR

Lat - LATERAL

Med – MEDIAL

Tr .abdominis - TRANSVERSE ABDOMINIS

Asc. Colon - ASCENDING COLON

Tr. Colon - TRANSVERSE COLON

Sig .colon – SIGMOID COLON

Tr.mesocolon - TRANSVERSE MESOCOLON

SI - SMALL INTESTINE

SMA - SUPERIOR MESENTERIC ARTERY

IMA - INFERIOR MESENTERIC ARTERY

MCA – MIDDLE COLIC ARTERY

RCA - RIGHT COLIC ARTERY

LCA – LEFT COLIC ARTERY

Rt - RIGHT

Lt - LEFT

CRC - COLO RECTAL CANCER

CBC – COMPLETE BLOOD COUNT

CEA – CARCINO EMBRYOGENIC ANTIGEN

LFT - LIVER FUNCTION TEST

FS – FLEXIBLE SIGMOIDOSCOPY

LDH - LACTATE DEHYDROGENASE

TCE – TOTAL COLONIC EXAMINATION

DCBE – DOUBLE CONTRAST BARIUM ENEMA

ERUS – ENDO RECTAL ULTRA SOUND

turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

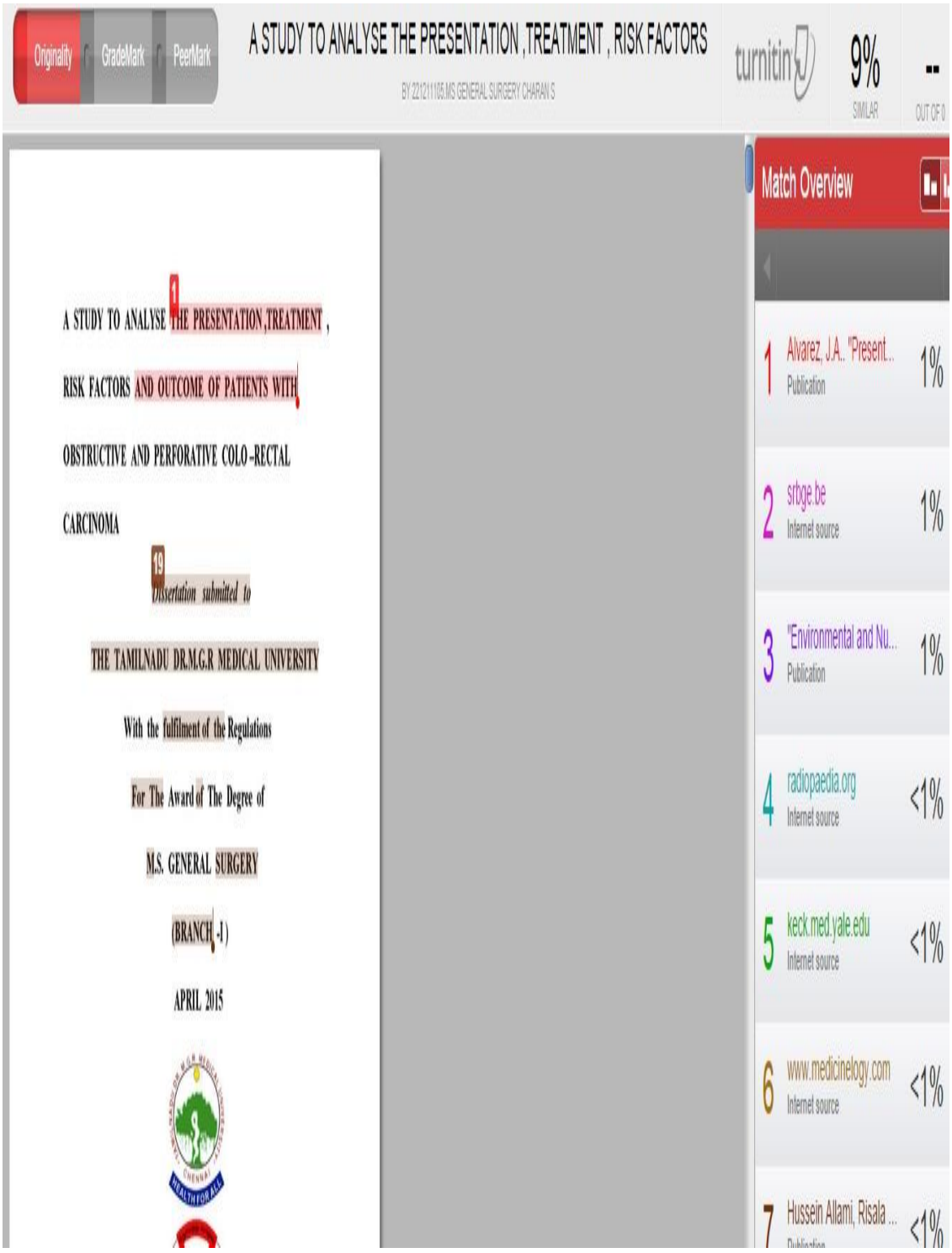
Submission author:	221211105.ms General Surgery CH...
Assignment title:	TNMGRMU EXAMINATIONS
Submission title:	A STUDY TO ANALYSE THE PRES...
File name:	CHARAN_DISSERTATION_FINAL.pdf
File size:	2.58M
Page count:	139
Word count:	10,325
Character count:	55,392
Submission date:	22-Sep-2014 06:17AM
Submission ID:	453200945

A STUDY TO ANALYSE THE PRESENTATION ,TREATMENT ,
RISK FACTORS AND OUTCOME OF PATIENTS WITH
OBSTRUCTIVE AND PERFORATIVE COLO -RECTAL
CARCINOMA

Dissertation submitted to

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

With the fulfilment of the Regulations


Originality
GradeMark
PeerMark
A STUDY TO ANALYSE THE PRESENTATION ,TREATMENT , RISK FACTORS
BY 221211105.MS GENERAL SURGERY CHARAN S
turnitin
9%
SIMILAR
--
OUT OF 0
A STUDY TO ANALYSE THE PRESENTATION,TREATMENT ,
RISK FACTORS AND OUTCOME OF PATIENTS WITH
OBSTRUCTIVE AND PERFORATIVE COLO-RECTAL
CARCINOMA
Dissertation submitted to
THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY
With the fulfilment of the Regulations
For The Award of The Degree of
M.S. GENERAL SURGERY
(BRANCH -I)
APRIL 2015
Match Overview
1 Alvarez, J.A.. "Present... Publication 1%
2 srbge.be Internet source 1%
3 "Environmental and Nu... Publication 1%
4 radiopaedia.org Internet source <1%
5 keck.med.yale.edu Internet source <1%
6 www.medicinelogy.com Internet source <1%
7 Hussein Allami, Risala ... <1%

Ref.No.6506/E1/5/2014

Madurai Medical College,
Maduai -20. Dated: 31 07 .2014.

Institutional Review Board/Independent Ethics Committee
Capt.Dr.B.Santhakumar,MD (FM). deanmdu@gmail.com
Dean, Madurai Medical College &
Government Rajaji Hospital, Madurai 625 020 . Convenor

Sub: Establishment – Madurai Medical College, Madurai-20 –
Ethics Committee Meeting – Meeting Minutes - for July 2014 –
Approved list – reg.

The Ethics Committee meeting of the Madurai Medical College, Madurai was held on 22nd July 2014 at 10.00 Am to 12.00 Noon at Anaesthesia Seminar Hall at Govt. Rajaji Hospital, Madurai . The following members of the Ethics Committee have attended the meeting.

1.Dr.V.Nagarajan,M.D.,D.M(Neuro) Ph: 0452-2629629 Cell No.9843052029 nag9999@gmail.com.	Professor of Neurology (Retired) D.No.72, Vakkil New Street, Simmakkal, Madurai -1	Chairman
2.Dr.Mohan Prasad, MS.M.Ch. Cell.No.9843050822 (Oncology) drbkcmp@gmail.com	Professor & H.O.D of Surgical Oncology (Retired) D.No.32, West Avani Moola Street, Madurai.-1	Member Secretary
3. Dr.L.Santhanalakshmi, MD (Physiology) Cell No.9842593412 dr.l.santhanalakshmi@gmail.com.	Vice Principal, Prof. & H.O.D. Institute of Physiology Madurai Medical College	Member
4.Dr.K.Parameswari, MD(Pharmacology) Cell No.9994026056 drparameswari@yahoo.com.	Director of Pharmacology Madurai Medical College.	Member
5.Dr.S.Vadivel Murugan, MD., (Gen.Medicine) Cell No.9566543048 svadivelmurugan_2007@rediffmail.com.	Professor & H.O.D of Medicine Madurai Medical College	Member
6.Dr.A.Sankaramahalingam, MS., (Gen. Surgery) Cell.No.9443367312 chandrahospitalmdu@gmail.com	Professor & H.O.D. Surgery Madurai Medical College.	Member
7.Mrs.Mercy Immaculate Rubalatha, M.A., Med., Cell.No.9367792650 lathadevadoss86@gmail.com	50/5, Corporation Officer's Quarters, Gandhi Museum Road, Thamukam, Madurai-20.	Member
8.Thiru.Pala.Ramasamy, B.A.,B.L., Cell.No.9842165127 palaramasamy2011@gmail.com	Advocate, D.No.72,Palam Station Road, Sellur, Madurai-20.	Member
9.Thiru.P.K.M.Chelliah, B.A., Cell No.9894349599 pkmandco@gmail.com	Businessman, 21 Jawahar Street, Gandhi Nagar, Madurai-20.	Member

The following project was approved by the committee

Name of the PG Student	Course	Name of the Project	Remarks
Dr.S.Charan	PG in M.S (General Surgery) Govt. Rajaji Hospital and Madurai Medical College, Madurai	Study on presentation ,treatment and multivariate analysis of risk factors for obstructive and perforative colorectal carcinoma.	Approved

Please note that the investigator should adhere the following: She/He should get a detailed informed consent from the patients/participants and maintain it confidentially.

1. She/He should carry out the work without detrimental to regular activities as well as without extra expenditure to the institution or to Government.
2. She/He should inform the institution Ethical Committee, in case of any change of study procedure, site and investigation or guide.
3. She/He should not deviate the area of the work for which applied for Ethical clearance.
   She/He should inform the IEC immediately, in case of any adverse events or serious adverse reactions.
4. She/He should abide to the rules and regulations of the institution.
5. She/He should complete the work within the specific period and if any extension of time is required He/She should apply for permission again and do the work.
6. She/He should submit the summary of the work to the Ethical Committee on completion of the work.
7. She/He should not claim any funds from the institution while doing the work or on completion.
8. She/He should understand that the members of IEC have the right to monitor the work with prior intimation.

Member Secretary
Ethical Committee

Chairman
Ethical committee

31.7.14
DEAN/Convenor
Madurai Medical College & Govt.
Rajaji Hospital, Madurai.

To
The above Applicant
-thro. Head of the Department concerned