CHAPTER V
DISCUSSION

Besides physical examination, a diseased colon could be examined roentgenographically and by endoscopy. Both play a very important role in establishing accurately the nature and site of pathology. Roentgenographically the colon can be examined as follows:

(1) Plain X-ray abdomen
(2) Progress barium meal
(3) Barium enema.

The plain roentgenograms of abdomen gives only a limited information about the morphology of colon but is of great value in acute and subacute obstruction where other two examinations are not possible. The gas and fluid present in the gut provides the contrast medium. The soft tissue shadow of various organs and other pathological calcifications are helpful.

Ingestion of barium sulphate suspension and subsequently chasing it to the colon is another method of examination. This examination is time consuming and may extend over many days specially in cases of chronic constipation, partial obstruction and diverticulosis. The barium sulphate has a tendency to form hard scybala if retained too long in the gut and thus it may precipitate an acute obstruction. The colonic
morphology is also not so well brought out on barium meal examination. Haenisch (1911) was the first to point out the drawbacks of this examination as compared to barium enema.

The barium enema examination is the sheet anchor in the roentgenologic investigation of colon. Fischer in 1923 established the technique of double contrast examination. This technique was later developed by Weber (1930) and S. Welin (1958).

The diagnostic value of the double contrast examination had been stressed by many workers. Moreton, Cooper and Foegelle in 1951 performed the double contrast examination in one stage and reported its advantages as compared to conventional 3-stage examination. The method was later modified and used by Templeton et al (1951), Douglas (1953), Root et al (1954) and others.

Pridie (1965) brought out a simpler modification which was used in this study. The cases were prepared on the regime described by Yates et al (1950). It was found to be quite satisfactory.

A comparative study of barium sulphate suspensions was made as done by Moreton and Yates (1950) and it was concluded that those containing suspending medium were suitable. The suspension with C.M.C. was better as it showed a uniform and complete mucosal lining. The drainage was also better and satisfactory. The difficulties
encountered by Smedal (1946) and Stevenson et al (1952) in double contrast examination of colon were not experienced in this series. The roentgenograms so obtained were quite revealing.

The various complications reviewed by Pyle et al (1960) and Seaman et al (1965) were not encountered in our series. The patient only experienced slight discomfort during air insufflation.

The method was specially of value because of its simplicity and speed. The procedure required no special equipment as used by Templeton and Addington (1951) and by Crozier (1954). This also required minimal toilet and nursing facilities. Here the patient did not leave the roentgenographic table during the examination. Thus the whole examination was completed in less than 50% of the time required in conventional methods. In our cases the examination was mostly completed in less than 30 minutes. As the time required was less, there were no chances of barium suspension drying on the bowel wall leading to unsatisfactory roentgenograms. Further it was possible to regulate the amount of suspension in the colon by this technique which helped in producing an ideal double contrast pictures.

In this study 50 cases were examined by the above method and their findings were analysed. Out of these
50 cases, 29 were males and 21 females. The maximum number of cases fell between the age group of 20 to 50 years (33 cases). The youngest was a child of 7 years and oldest aged 72 years.

27 cases were reported as normal while the rest 23 cases had some roentgenographically visible pathology in the colon as shown in the table No.II. These cases came with various symptoms and clinical findings (Table I) which indicated a barium enema examination. The main indications were altered bowel habits, abdominal pain, passage of blood and mucus in stools or palpable intra abdominal lump.

In the series from Southern General Hospital published by Dempster (1958) there were 185 (61 %) which showed no abnormality out of 303 colonic examinations. The diseases reported were diverticulosis 18.1 %, colitis 6.3 %, carcinoma 4.9 % and Megacolon 1 %. The series were of elderly patients aged between 51 to 70 years.

Bhattacharyya et al (1958) analysed 614 cases from Vellore (S. India) and found that 390 cases were normal. They reported that colitis was the commonest lesion (10.6 %) after which were tuberculosis (8.9 %), carcinoma (6.1 %), megacolon (2.4 %). They found only 5 cases of diverticulosis and 3 cases of polyps.
Normal Colon:- In many cases it was easy to identify the ileocaecal valve. Hinkel (1952) was able to define it in 92% of cases in 500 enema examinations.

The reflux of suspension in terminal ileum was seen normally. Fleischner and Bernstein showed this in 90% of their cases.

The hyperdescent of caecum was reported to be 15% in series by Harvey (1918). Four such cases of hyperdescent were encountered in this series.

A redundant pelvic colon was found in 4 cases which was central pelvic loop type. Kantor (1931) reported its incidence as 16% in his series of 1614 cases.

Congenital anomalies

The congenital anomalies of the colon are rare. The incidence of megacolon in live births is reported to be approximately 0.005%. 90% of these were male children. The idiopathic megacolon has milder clinical features and a narrowed aganglionic segment is not demonstrable as in Hirschsprung's disease (Zuelzer and Wilson 1948). Commonly the distal part of colon is involved as seen in case No.26.

The anomaly of rotation is also a rare occurrence. The case No.27 illustrates the arrest in normal phenomenon of rotation (mal-rotation). Here the normal anti-clock-wise rotation had been arrested at 90° instead of
completing 180°. The condition is a perpetuation of the embryonic second stage rotation which is at the 8th week. Kent and Raszkowski (1959) reported a similar case of mal-rotation. This is commoner than other forms of anomalies of rotation such as non-rotation or reverse rotation. Schultz et al (1961) found 47 cases of mal-rotation out of 57 cases of rotational anomalies of gut.

The volvulus of caecum is generally due to presence of long mesentery which is an anomaly of fixation. Smith (1911) found the presence of mesentery in caecum and ascending colon in 30% of 982 newborn infants while Treves reported its incidence of 26% in adults.

A freely mobile caecum can undergo torsion and may produce acute or recurrent attacks of obstruction. Sweet (1930) described chronic and recurring caecal volvulus presenting with transitory attacks of right lower abdominal pain and vomiting. Wilson et al (1954) reported its percentage of incidence as 0.083%.

Case No.27 presented as recurrent attacks of pain in right iliac fossa. The double contrast roentgenogram outlined the upturned caecum, the apex of which was seen directed up and to the left. The position of appendix and ileum was also seen.

**Inflammatory lesions**

**Ulcerative colitis:** Four cases (cases No.29, 30, 31, 32)
31 and 32) were diagnosed as ulcerative colitis (Table III). All of these cases were males and were between 16 to 30 years of age. They presented with bleeding per rectum, griping pain and anaemia. The stool examination showed the presence of cellular exudate and erythrocytes. Besides these the case No.31 had pus cells and case No.32 had cysts of giardia and trichomonas in stools. On sigmoidoscopic examination all of them presented typical appearances of ulcerative colitis.

In the series reported by Spencer et al (1962) the disease was rare below 10 years (2.2 %) and also above 60 years (3.5 %). Bockus (1956) found the incidence of ulcerative colitis below the age of 15 years as 10.4 %. In his series 58 % had entire involvement of colon and the relapsing clinical type was commonest (64 %).

In this study two cases (No.29 and 30) had involvement of whole colon while the rest two cases showed changes confined to left half of the colon. Case No.29 also had involvement of terminal ileum (entero-colitis). All these cases gave history of recurrent attacks of their illness.

Cases No.29 and 30 showed multiple granulomatous pseudo-polypi in entire colon. Wesson and Bargen reported its incidence as 10 % in cases of ulcerative colitis.

Case No.30 showed toxic dilatation of transverse colon which measured 10 cm. A similar case has been
reported by O. Gsell (1961) where the width of the transverse colon was 12 cm. In the series of Roth et al (1959), the most frequent segment involved in toxic megacolon was transverse colon (50 %) and the average degree of dilatation found was 9 cm.

Ileocaecal Tuberculosis

In this study 7 cases were diagnosed as cases of ileocaecal tuberculosis (table IV). Out of these seven, six were females and they were between 20 to 50 years of age. All of them had anaemia of mild to severe degree. Five cases (No.33, 35, 37, 38 and 39) presented with a palpable lump on the right side of abdomen. Cases No.33, 34, 35 and 39 had evidence of tuberculosis in chest. Radiological involvement of ileum, caecum and ascending colon was present in all cases except in case No.35 where only caecum and ileum was involved. In 4 cases the diagnosis was confirmed on laparotomy and a right hemicolectomy was performed in each case.

After the first authentic report published by Stierlin in 1911 many workers reported the roentgenological findings of ileocaecal tuberculosis. Davis (1933) reported 85 % involvement of ileocaecal region in intestinal tuberculosis. In India Ukil (1942) found that in 1000 cases of intestinal tuberculosis 95 % had pulmonary lesion and thus those were secondary to pulmonary tuberculosis.
Other workers could not find such high figures. Howell and Knapton (1964) reported that their 50% cases had such an association.

**Stricture Colon**

Two cases of isolated segmental narrowing of the colon were detected. Both of these cases were females and aged 22 and 24. There was no pulmonary lesion present in both and the caecum and terminal ileum were normal on barium meal study. However, case No.41 showed evidence of enteritis in the form of stricture of jejunum on barium meal. Mesenteric glands also showed calcification in this case. The radiological findings of case No.41 were confirmed on laparotomy and these strictures were found to be due to tuberculosis. The nature of lesion of case No.40 could not be determined because she refused surgery.

Goldfarb et al (1931) brought out that in the absence of ileocaecal lesion it was very difficult to diagnose isolated colon tuberculosis. Hancock (1959) and Rhoades et al (1960) reported 66 cases of segmental hypertrophic tuberculosis of colon.

**Diverticulosis**

The figures reported for incidence of diverticulosis of colon are varied. Ochsner et al (1935) reported 7% while Pemberton et al (1947) found 8.5% in his series of
Dempster (1968) had 18.1% incidence in patients aged between 61 to 70 years. Reichman (1962) estimated that 10% of population over 40 years has diverticulosis. It has been shown that the incidence increases with the increase of age. Welch (1953) estimated that 66% of all people over the age of 85 years will have diverticulosis.

The incidence in India is reported to be low. Bhattacharyya et al (1958) found only 5 cases in a series of 614 enema examination while no case of diverticulosis was reported by Gadekar (1966) in his series. In this present work two cases were diagnosed one as diverticulosis and other as diverticulitis. Both were male and aged 61 and 62 years. Case No.42 showed moderate sized multiple diverticula, mainly in the caecum and ascending colon. Anderson estimated that incidence of diverticulosis of right half of colon was only 0.7 to 1.5%. Bockus (1936) found its occurrence in 4%.

There was no hiatus hernia or other crural or inguinal hernia detected which is reported to be present in 10.5% of cases (Saint's Triad).

Case No.43 had vesico colic fistula caused by diverticulitis and presented as pneumaturia. It is estimated that 14% of the diverticulosis gets inflammed (diverticulitis) and out of these 15 to 20% need surgery
(Ochsner and Bargen 1935). In this case the roentgen findings were typical of diverticulitis and the segment affected was sigmoid and descending colon.

In various series this part of gut was most commonly affected (70 - 80 %). Mailer (1928) reported that in 40 % of cases the diverticula were confined to sigmoid colon.

Spastic Colon

Case No.44, a female aged 72 years, presented with splenic flexure syndrome. The transverse, descending and sigmoid colon showed narrowing with number of small haustrations.

Maingot in 1935 brought out that this condition was occurring more commonly. Previously it was thought to be a rare disease as reported by Boas (1901) and Cohnheim (1909). Gadakar (1966) reported 7 cases in his series.

Almy et al (1947) brought out the stress as the main cause of this spastic colon. The condition was found to be more common in females.

Tumours

In case No.45 a polyp of 1 cm. was detected in rectum on sigmoidoscopy and a polypectomy was performed. On double contrast examination this polyp could not be demonstrated. The other parts of colon were normal. The detection of small polyp is extremely difficult. Rider
et al (1954) reported that out of 401 patients with polyps only 7.2% were detected on roentgen examination. The incidence of polyps reported is quite variable. Wietersen (1957) found 3.1% in a series of 1000 cases while Welin (1958) found 11% in a series of 9000 patients. The number of cases reported in India is still less. Gadekar (1966) found 4 cases out of 405 pathological colon and Bhattacharyya et al (1958) detected 3 cases in 614 enema examinations using tannic acid and double contrast methods.

Intussusception which is common in childhood (78.5% below 2 years) is rare in adults. This caused the intestinal obstruction in 21% of cases (Souttar, 1925) and 15% in series by Vick (1932).

In adults it is usually secondary to some organic lesion of the gut. The intraluminal polypoidal growth is the commonest cause.

Dick and Green (1961) reported 15 cases of intussusception in adults due to various causes commonest of which was a polypidal growth. In case No. 46 the precipitating factor for the intussusception was a leiomyoma of the small intestines. The case presented as recurrent intestinal obstruction.

Baker and Good (1955) analysed these tumours occurring in gastrointestinal tract. They found that
small intestines was the second commonest site of its occurrence (23.4 %) after stomach (65.8 %).

Carcinoma Colon

The colon and rectum is reported to be the most frequent site for carcinoma. In a series from American Cancer Society quoted by Bockus (1964), the incidence of these tumours was reported to be 13.8 %. The Metropolitan Insurance Company reported still higher figures i.e. 17 %. Histologically 97.8 % of these malignant tumours were adenocarcinoma.

Three cases of malignancy of colon were found in this study. The growth in case No.47 was annular type arising from sigmoid colon. This produced a napkin ring type of filling defect. The carcinoma at this site is reported to be quite common, second only to rectum as reported in Mayo Clinic statistics.

In other two cases No.48 and 49 the growth was on the right side of colon. In case No.48 it was in the ascending colon while in case No.49 it was involving hepatic flexure and transverse colon. Both of these were polypoidal type and produced a finger print type of irregular filling defect. Clinically all these cases presented with lump, anaemia and bowel disturbances. The stools for occult blood was positive in all the cases. Cysts of E.H. was also positive in 2 cases.
Cole and co-workers (1954) made an interesting observation regarding the occult blood in stools and anaemia. They found that 70% of patients with carcinoma in right colon were anaemic but only 48% showed positive occult blood test in stools while 46% of patients with left colon malignancy were having anaemia. Yet the occult blood was found in faeces in 64%.

Case No.47 died in wards while others were operated. The growths in these two were adenocarcinoma.

The double contrast roentgenograms showed clearly the involved segment of colon preoperatively. The lesion could be seen through the overlying loops.

**Postoperative**

The colon examination was performed in case No.50 to exclude any postoperative recurrence. In this case a growth was resected in 1965 from the transverse colon. There was no radiological evidence of recurrence found and the patient was kept under further observations.

The recurrence produced a unilateral filling defect instead of bilateral narrowing of anastomosis. This was brought out by Fleischner et al (1956). Agnew et al (1962) reported the radiological findings in postoperative recurrence of resected colon and said that any irregularity, eccentric mass projecting in lumen and lack of pliability of wall should be looked with suspicion. The double contrast study brought out these features well.