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# Surgical Treatment of Congenital Megacolon

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INDEX



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# I. THE SURGICAL TREATMENT OF IDIOPATHIC CONGENITAL MEGACOLON (Hirschsprung's disease)

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## Introduction

The striking clinical features, the unique pathological findings and the evasiveness of the etiological factors have made Hirschsprung's disease a provocative and stimulating enigma. Many investigators in the past have tried to solve the mysteries of etiology and therapy but without convincing success. Recently the observations of Whitehouse and Kernhan[1] and Neuhouser, Swenson and their co-workers[2] have resulted in a better understanding of the pathogenesis of this disease and permitted a more rational approach to treatment. Because it is an infrequent disease (occurring once in every 10,000 births)[3] we felt that reporting our experiences with seven patients treated surgically would be worthwhile.

## Review of the Literature

According to Ruhrah,[4] Billard[5] in 1810 was the first to report the autopsy findings in a case of congenital megacolon. He described colonic sclerosis and dilatation in a six day old male. In 1867 Lewitt[6] of Chicago reported the first case from this country. A number of other authors, (Von Ammon,[7] Barth,[8] Peacock,[9] Gee,[10] Bristow,[11] Morris,[12] Futterer and Middeldorf,[13] Cheadle,[14] Guame[15] and others,) reported cases but it remained for Hirschsprung[16] to give the disease its classical description at the meeting of the Berlin Congress for Children's Diseases in 1886. Since the latter report, the disease entity has been well recognized by the medical profession and numerous case reports have found their way into the literature.

It was Hirschsprung, too, who in later case reports[17] divided cases into two groups:

(1) Those occurring in infancy (true megacolon), (2) Those occurring in adult life (pseudomegacolon). Although accepted by some, this classification met considerable opposition primarily because all cases of dilatation of the colon with marked obstipation were called megacolon. In light of more recent findings, it is important to differentiate true megacolon from the pseudomegacolon for in the latter the pathological findings, treatment and prognosis are decidedly different. Much of the confusion regarding the results of certain forms of treatment can be traced to this failure of differentiating between true and pseudomegacolon.

## Etiology

The theories advanced to explain Hirschsprung's disease fall into three categories.

Congenital. Hirschsprung[17] felt that the dilatation and hypertrophy of the colon was a congenital defect. Mya[18] thought that the dilatation of the bowel was congenital in origin but the hypertrophy was secondary, while Fenwick[19] and Genersich[20] held the reverse to be true, i. e., that hypertrophy was primary and the dilatation secondary. The fact that the specific pathological changes in the bowel have been noted in foetus and in the newborn add considerable support to the congenital theory but the nature of the developmental defect was never explained by these theories.

Mechanical, Bartle[22] thought that patients with megacolon had an abnormally long mesasigmoid which predisposed to torsion and obstruction of the bowel. Marfan[23] felt the obstructing mechanism was a kinking at the pelvic rectal junction. Perthes[24] noted that water introduced through the rectum would pass out readily through a colostomy but fluid introduced into the colostomy would not be passed per rectum. He felt that the phenomenon was best explained by postulating the presence of obstructing the valves at the pelvirectal junction. Treves[25] described rectal and anal atresia as the basic defect while Concetti[26] claimed that localized congenital aplasia of the muscular coats of the large intestine immediately above

the rectum was the obstructing mechanism. Critical evaluation of the above theories points to the fact that in congenital megacolon no obturating obstructing mechanism other than fecal contents within the lumen has been found.

Neurogenic. In absence of any apparent obstructing mechanism to explain the changes in the bowel, many investigators have literally been forced to postulate some type of deficiency of the nerve supply to the bowel as the basic defect in congential megacolon.

Fenwick[19] in 1900 though megacolon was due to reflex spasm of the internal anal sphincter. Hurst[21] felt that failure of relaxation of the internal anal sphincter (achalasia) was the prime difficulty, while Pennato[27] thought that a localized paralysis of a bowel segment was the basic problem. Hawkins[28] in 1907 considered the condition to be due to neuromuscular incoordination in one portion of the large bowel which prevented the normal peristaltic wave from passing through it and thus there was impedence to the passage of intestinal content beyond this abnormal area. In 1926 Fraser[29] described malfunction of the colon in cases of congenital megacolon associated with defective relaxation of the internal sphincter due to abnormalities in the involuntary nervous system. Wade and Royal[30] in 1927 stated that the disease was due to an overactivity of the sympathetic nervous system and they performed lumbar sympathectomy with apparent success. In that same year Martin and Burden[31] claimed that "rectosigmoid sphincterismus" due to derangement of the intrinsic nerve supply of the bowel caused a partial intestinal obstruction which resulted in enlargement of the bowel proximally. In 1930 Scott and Morton[32] demonstrated that evacuation of the enlarged colon followed spinal anesthesia and this was interpreted as demonstrating the overactivity of the sympathetic nervous system.

Pathology

In the enlarged segments of the colon there is a marked increase in the thickness of all layers of the bowel, particularly the circular and longitudinal muscle layers. The mucosa frequently presents inflammatory changes and ulcerations. Attention has been focused on the myenteric plexuses of the bowel and conflicting reports regarding the status of this structure have appeared in the literature. In 1901 Tattel[33] demonstrated scanty ganglion cells in the enlarged colon at varying levels, and felt that there was interference with peristalsis. In 1904 Brentano[34] stated that the "nerve elements" in the large intestine were weakly developed but failed to specify which portions of the intestine he meant. In 1908 Finney[35] showed that the ganglion cells in the enlarged colon were present in normal numbers and did not show any degenerative changes. In 1920 and 1924 dalla Valle[36&36a] studied many sections of various portions of the large bowel with special reference to the nerve cells of the myenteric plexuses in two cases. He found that the ascending, transverse and descending portions of the colon were enlarged but the sigmoid was of normal caliber in both cases. The cells of the myenteric plexuses were normal in appearance and number in the cecum, ascending, transverse and descending colon but in more than 100 sections from the sigmoid colon no nerve cells could be found.

In 1927 and 1928 Cameron[37,38] reported two cases of congenital megacolon in which he found no change in the myenteric plexuses of the distended and hypertrophied colon, but at the pelvic rectal area where the colonic distention stopped and where the bowel had a more normal diameter he noted that the ganglion cells of the myenteric plexus were replaced by imflammatory cells. Cameron felt these changes were due to destruction of the ganglion cells by some unknown agent. In 1934[39] and 1937[40] Etzal studied a number of cases that had both acquired megacolon and megaesophagus. He found disappearance of nerve cells and degenerative changes in the myenteric plexuses in the terminal portions of the colon.

In 1938 Robertson and Kernohan[41]

described changes in the myenteric plexus of the colon in one patient consisting of decrease in the size of the myenteric plexus with vacuolation and disappearance of ganglion cells.

In 1940 Tiffin, Chandler and Faber[42] studied a case of congenital megacolon very carefully and found that where the dilated bowel passed into normal calibered sigmoid there were for a distance of from 5 to 7 cm. no ganglion cells, but unusually abundant nerve fibers were present in Auerbach's plexus. Elsewhere the ganglion cells were normal both above and below the point where the normal sigmoid colon and dilated bowel met. They postulated that the primary disturbance was a localized interference with the passage of normal peristaltic waves across the sigmoid colon due to defective innervation. This resulted in a functional partial obstruction with secondary dilatation and hypertrophy in the proximal bowel.

Whitehouse and Kernohan in 1948[43] published, in a most-complete fashion, their findings in 11 cases of congenital megacolon and 5 cases of secondary megacolon. The myenteric plexus was found to be absent in the most distal part of the colon in all cases of congenital megacolon. In 80% of cases it was absent in the "transitional region", i.e., the area of beginning dilatation between rectum and sigmoid, and in 60% of the cases it was, in addition, absent in the lower part of the sigmoid. In 20% of cases absence of the myenteric plexus extended into the upper sigmoid and lower descending colon. Above this point, i.e., descending colon, transverse colon and ascending colon the myenteric plexus appeared to be normal. In all cases of congenital megacolon there were nerves present, when the myenteric plexus was absent, which were not seen in the control cases. As a result of this study the authors felt that the basic cause of megacolon was the absence of parasympathetic innervation and a consequent increase in the action of the sympathetic nervous system in parts of the colon where the myenteric plexus was absent. Since the parasympathetic nerve fibers are motor to the gut and the sympathetic nerve fibers inhibitory, it seems reasonable to assume that the absence of motor activity and an increase in inhibition would result in a functional obstruction with secondary dilatation and hypertrophy of the proximal colon.

Recently, Swenson and co-workers[44] by means of colonic motility studies using a multiple balloon technique have presented evidence supporting the contention that congenital megacolon is due to malfunction of the rectum and rectosigmoidal area that results in partial colonic obstruction.

The weight of evidence thus appears to point to a basic defect in the myenteric plexus in the rectum, rectosigmoid and sigmoid colon which produces a functional obstruction with secondary dilatation and hypertrophy of the bowel proximally. However, there are a number of points which prevent wholehearted acceptance of this theory, (1) The absence of the ganglion cells of the myenteric plexus is not always seen in the narrowed rectosigmoid area[45] and the myenteric plexus may be absent from the dilated bowel as well, (2) The rectum, as visualized by barium enema, appears to be normal in regards to size, shape, distensibility and contractibility. (3) If the changes in the bowel proximal to the narrowed areas were secondary to obstruction alone one would expect the cecum, because it has the largest diameter of all portions of the colon, to have the maximum dilatation[46]. In all of our cases we have been able to show that the maximum dilatation is in the sigmoid rather than the cecum and if one obtains good roentgenograms of the colon after thorough emptying one sees that the ascending and variable extents to the transverse portions of the colon are capable of active peristaltic contractions while the dilated sigmoid shows no peristaltic activity or contraction whatsoever. It is our feeling that the basic defect of impaired or altered physiological activity does not involve the rectum and is not confined to the narrowed sigmoid alone but involves also the dilated sigmoid, descending and variable extents of the

transverse portions of the colon. In support of this concept we point to the fact that there is apparently a difference in the parasympathetic innervation of the ascending and right side of the transverse colon as compared to the left side of the transverse and sigmoid parts of the colon. The vagus supplies the former whereas the sacral parasympathetics supply the latter. (4) No good histological studies of the central nervous system in these cases have been done to rule out a lesion in brain or spinal cord as the cause for this condition.

Diagnosis:

All of our cases presented the typical history that characterizes other reports on this condition; namely, obstinate constipation and marked abdominal distention from birth or early infancy. Vomiting was frequent and diarrhea alternated with the constipation. Poor nutrition, anorexia, failure to gain weight, and grow in height, weakness, dyspnea and anemia were also noted. On physical examination the marked abdominal distention was accentuated by the thin facies, prominent ribs, and "toothpick" arms and legs. The costal margins of our patients were widely flared and large loops of bowel could readily be seen beneath the thin abdominal wall. The fecal filled redundant loops of colon were readily palpated and had a thick, doughy consistency. On rectal examination, one was impressed with the absence of feces in the rectal ampulla. Proctoscopic examination revealed a normal appearing empty rectum and no obstruction was met as the scope passed into a widely dilated loop of sigmoid colon containing large masses of feces.

After the large bowel was cleaned out completely by repeated cleansing enemas, a barium enema study revealed (1) a normal appearing rectum (2) a narrow segment of rectosigmoid (3) a widely dilated sigmoid colon which usually obscured the degree of dilatation of the remaining colon. These findings are similar to those emphasized by Neuhouser[2] and they must be present before a diagnosis of true congenital megacolon can be made. Other conditions such as pseudomegacolon or dolichocolon, idiopathic constipation of childhood, obstructing congenital bands or diaphragms of the ani-rectal area, anal stenosis, and spina bifida may give the clinical picture of true congenital megacolon, but they do not represent pathognomonic roentgenographic changes as described above. As pointed out by Neuhouser[2] to visualize the narrowed rectosigmoid area only a small amount of barium should be injected while the patient is being examined fluoroscopically in an oblique position. If these instructions are not followed the barium will pass readily into the dilated colon and obscure the narrowed rectosigmoidal area.

We have noted no additional roentgen findings of importance in our cases. If sufficient barium is given to fill the colon proximal to the markedly dilated sigmoid it becomes apparent that although the cecum, ascending and variable extents of the transverse colon are dilated, they have not lost their haustral markings. After the barium is evacuated, the haustral markings and contractility of the right side of the colon stands out in marked contrast to the dilated, contractless sigmoid colon. As described below, we have utilized this finding to determine the extent of colonic resection in our cases.

Treatment

1. Non-operative or medical treatment.

This form of therapy has been built around special diets, laxatives and enemas. In this regard Friedell[47] has shown that hot water enemas (115°F) are capable of assuring more effective evacuations of the colon. Hurst[26] advocated using increasingly larger conical bougies to induce a better relaxation of the internal sphincter. Stebins, Scott & Morton[48] have reported temporary remissions after the use of spinal anesthesia.

Numerous reports have also been written regarding the efficacy of certain drugs in this malady. Good results have been reported following the use of parasympathomimetic drugs such

as mecholyl bromide[49] and Doryl[50] (carbamoyl choline chloride); but conversely equally good results have been claimed for syntropan[51] which is sympathomimetic.

There is no question that a small percentage of cases may be handled effectively using medical treatment, and it should be tried on all patients. However, in most instances medical therapy is neither effective nor practical. The mortality attending conservative treatment has also been rather high. Danziger[52] reported 75 per cent mortality, Schneiderhohn[59] 79 per cent and Ask-Upmark[54] 37 per cent with conservative therapy. It should be added, however, that these mortality rates pertain to the pre-transfusion, and pre-antibiotic era and the mortality figures are undoubtedly lower now. Although medical therapy may be successful it is rarely ideal for it entails untold hardship on both parent and child. No one can blame a child or his parent looking for relief from the disagreeable task of colonic lavage even though daily fecal evacuations are produced thereby. We have been impressed, too, with the personality and behavior problems that these patients have presented even though their colons are being emptied successfully by enemas.

## Surgical Treatment

Surgical procedures have been carried out either on the extrinsic nerve supply of the colon or directly on the large bowel itself.

## Sympathectomy

In 1927 Wade and Royle[30] did the first sympathectomy for congenital megacolon. They did a lumbar ramisection. While Learmonth and Rankin[55] advised division of the presacral nerve and inferior mesenteric plexus, Judd and Adson[56] felt that bilateral lumbar sympathectomy was preferable. Later Adson[57] advocated infradiaphragmatic resection of the splanchnic nerves, and removal of the coeliac and upper two lumbar ganglion. De Takats and Biggs[58] and Ladd & Gross[50] have also advocated lumbar sympathectomy for the treatment of congenital megacolon.

It is difficult to evaluate the efficacy of sympathectomy as a form of therapy for Hirschsprung's disease. The most thorough evaluation of this problem has been made by Ross[59] and Passler[60]. In 29 cases studied by Ross, relief was obtained in 21, improvement occurred in seven and the remaining patient died three months after operation. Passler reviewed the literature and found 117 cases of megacolon in which sympathectomy was performed. He reported relief was obtained in 38 of the cases and improvement was observed in 64. The results were classified as a failure in 12 of the cases and three patients died. These results in the main, are good but the follow-up in most cases was of short duration. The early enthusiasm for this procedure has waned for it has become obvious with the passage of time that recurrence of symptoms is frequent and since the size of the bowel is not apparently altered, the dangers of volvulus remain. Grimson[61] points out, too, that sympathectomy may decrease or interrupt the impulses over the pathways for visceral pain which give early warning of impaction, pressure necrosis or volvulus. Another serious objection is that with both the Learmonth and Adson procedures, the male is rendered sterile because of interference with the ejaculatory apparatus.

## Surgical Procedures on the Bowel

The surgical treatment directed towards the bowel itself has varied considerably and includes the following:

Intestinal puncture, either through the abdominal wall or after a laparotomy has been tried in a considerable number of cases. As can be anticipated, the results were very poor[35].

Exploratory laparotomy alone for purposes of diagnosis or combined with the milking of the dilated bowel of its intestinal contents has been attempted on a number of occasions.[35] The only

purpose that exploratory celiotomy has served in this regard, is to establish the diagnosis because the removal of the fecal material by milking has, of course, only resulted in temporary benefit.

Colotomy with the evacuation of the contents of the bowel also has been done a number of times but although the immediate results are satisfactory, the patient has had a return of the symptoms quite quickly.[35]

Colostomy has been performed both as an emergency measure or to combat the intestinal obstruction which so frequently occurs with disease, as well as a preliminary to a more radical operation.[62] A few patients apparently have been left with a permanent colostomy and have benefited from this form of treatment. Coloplication has been used by Kredel[63] Franke[64] and others, but the results did not justify its continued use.

Colopexy has been tried a number of times. Treves[24] and Richardson[65] reported failures but others have felt that satisfactory results could be obtained by this means.

Entero-anastomosis without resection has been reported by Pfisterer[67] and others to have resulted in failures only. The two cases done by Lengemann[68] and Franke[64] died soon after operation from disruption of the anastomosis and peritonitis.

Perthes[23] made use of a procedure similar to a pylorostomy for pyloric obstruction. This operation was performed on the upper rectum but the results were unsatisfactory. Lawen[69] and Gant[70] divided Houston's folds with apparent success. Morris[71] tried splitting the soft parts posteriorly after the modified Kraske operation of the sacrum and evacuated the intestinal contents after introducing the arm into the bowel.

Treves[72] amputated almost all the large intestine, including the rectum, bringing the splenic flexure out of the anus. He felt that good results were obtained but as he puts it, "he hoped that the patient would soon develop control of the colostomy." The follow-up in this case also, was only of short duration. Finney[35] reported a case in which he first performed a colostomy at the hepatic flexure followed in about six months by a short circuiting operation between the ascending portion of the colon and the sigmoid flexure with the dilated bowel lelf intact. Five months later the dilated portion was excised and to complete the multiple procedure the colostomy was closed at a later date. The author stated the patient made an excellent recovery from this multiple stage procedure and was apparently normal in every respect, approximately a year after the completion of the operation.

Neugebauer[73] also favored multiple stage resections (exteriorization of Bloch-Mikulicz) because it commanded the lowest mortality. Others who have advocated resections of the giant colon include Terry,[74] Fischer,[75] Yeazell and Bell[66] and Anschutz[76]. The latter reported a mortality rate of only 10% and in 20 cases he had obtained apparent cures in 16.

Total removal of the colon has been advised by Barrington-Ward,[77] Mirizzi[78] and more recently, Grimson[61] and coworkers. In recent personal communication to us, Grimson[79] pointed out that he had done a complete colectomy with iliosigmoidostomy in four patients. Two of these patients have done very well but he felt that the removal of the ileocecal valve offers a definite handicap to the procedures and he is now in favor of medical treatment for all cases. Ladd and Gross[50] have reported their experience with both local resection as well as complete colectomy. Resection of the transverse colon or sigmoid loop was performed in ten patients with one death due to peritonitis. Five patients were greatly improved and in satisfactory condition one, four, ten, eleven and twelve years after operation. A sixthepatient was apparently improved for 14 years and then developed recurrences and involvement of other parts of the colon. In one patient there was no

apparent improvement, in another only slight improvement, and the remaining patient died eight months after operation of endocarditis. Complete colectomies with anastomosis between the ileum and the lower sigmoid were done in three patients. Two of these died shortly after operation from disruption of the intestinal suture line. The third patient did well for one year but at that time he developed ulcerations in the sigmoidal stump which perforated and produced a fatal peritonitis. Because of the tragic experiences Ladd and Gross feel that total colectomy should not be done.

In an excellent article Whitehouse, Bargen and Dixon[80] have analyzed their results with segmental colectomy in patients with congenital megacolon. They performed resections of the colon with temporary double barrel colostomies which were closed at varying times from a few weeks to several months after the original operation, when the patient had shown general improvement. They pointed out that where the colon was greatly dilated, they removed it down to the sigmoid colon and brought the ileum out along side of the sigmoid. The continuity of the bowel was restored at a later date. They had operated upon 29 patients with 7 deaths or a mortality rate of 24 per cent. They were able to evaluate 16 cases from the standpoint of follow-up for a period of from one to 32 years following operations. Thirteen of the patients obtained excellent results, that is they were restored apparently to good health and had bowel movements without the aid of laxatives or enemas. Three patients had good results and were so classified because they had either minute persistent fecal fistulae or they had to take some occasional laxative or enema. In six of the 16 cases, progressive or perhaps persistent dilatation of the remaining portion of the colon was noted in three, a fecal fistula persisted in two and in two cases proctoscopic examination disclosed postoperative constriction of the sigmoid flexure. These results of course are, in view of the long follow-up, very significant.

Very recently Swenson and his co-workers[81] have practiced the removal of the functionally deficient rectum and rectosigmoid by means of an abdominal resection of the narrowed distal segment and a portion of the contiguous dilated sigmoid segment with a "pull through" of the proximal dilated segment and preservation of the internal anal sphincter. Practically the entire rectum is removed with the anastomosis being made just above the internal sphincter from below. In 52 patients upon whom this operation has been performed there was one postoperative death and apparently complete cures were obtained in 51 patients. As early as three months postoperatively the colon apparently was essentially normal by barium enema examination. Bodian[82] and his co-workers reported 12 cases treated surgically by a slight modification of the Swenson technique. In eleven cases good results were obtained although the follow-up ranged from only one week to three months.

The thesis upon which Swenson and his co-workers have devised their operation is that the rectum and rectosigmoid are abnormal. Because the operative procedure necessitates the removal of the rectum it brings up the problem of damage to the nervi erigentes and thus impairment of penile erections. It is well known that after a combined abdominal perineal resection with removal of the rectum, the majority of male patients are impotent. The Swenson procedure does not entail as wide a removal of peri-rectal tissues as in the combined abdominal perineal resection and this fear of sterility may be unfounded, but in the young male the pelvis is narrow and consequently the nerves are more vulnerable. Until sufficient time has elapsed to evaluate the problem of damage to the nervi erigentes completely, it seems to us that other operative procedures in which the rectum is left undisturbed should be tried and evaluated.

The operative procedure which we have utilized in our cases is based on the altered physiological activity of the colon as determined by means of roentgenograms after the administration of a

barium enema. We have tried unsuccessfully both on the unanesthetized and anesthetized patient, to place multiple balloons in various segments of the colon in an effort to determine physiological activity of the large bowel. We were not able to place our balloons satisfactorily in the patients before operation from below and we have had no patient with a colostomy through which we could introduce the balloons as described by Swenson. In one patient under spinal anesthesia, the balloons were introduced per anum and placed in the colon under direct vision after opening the peritoneal cavity but the physiological activity of the bowel was depressed and no good tracings were obtained.

By means of fluoroscopic examination and roentgenograms after the administration of the barium enema we have determined in all of our cases the following important points: (1) The rectum is of normal caliber and is capable of dilatation and contraction. (2) There is a variable length of narrowing and spasm of the bowel beginning at the rectosigmoid junction and extending to the dilated sigmoid colon. (3) There is a definite difference between the activity of the right side of the colon including the ascending and right side of the transverse portions of the colon as compared to the left side of the transverse, descending and sigmoid portions of the colon. Even where there is marked dilatation of the right side of the colon after the barium enemas has been evacuated good haustral markings and peristaltic waves can be demonstrated roentgenographically. On the other hand we have not noted peristaltic waves of the descending or sigmoid colon. At operation, we have also been able to establish clearly that the rectum has a normal diameter and that there is a definite narrowing at the rectosigmoid junction of variable length separating the rectum from the markedly dilated sigmoid colon. The dilated and hypertrophied portions of the colon show characteristically an absence of the haustral markings and absence of the normal longitudinal muscular bands. In the cases that we have observed these changes have involved the sigmoid colon and the descending colon but there is a gradual transformation of the bowel in the left side of the transverse colon so that although there is dilatation still the haustral markings and the longitudinal bands as well as the thickness of the bowel appear normal.

Operative Procedures

Since these patients have suffered many years of chronic ill-health their nutritional status is impaired and special attention has been directed towards getting the patient in the best possible condition for operation. They have received a high chloric diet with vitamin supplements and where indicated repeated whole blood and plasma transfusions have been given to elevate the plasma proteins. It is important to take as much time as necessary to clean out the colon completely preoperatively and this may take many days. For three days prior to operation the patient is given aureomycin, 250 milligrams q.i.d. orally to decrease the intestinal bacterial flora. An intravenous injection of 5% glucose in distilled water is started in an arm before operation and since it has been shown that a large number of these patients may have idiopathic dilatation of the urinary bladder all our patients have had an urethral catheter inserted immediately after being anesthetized. For anesthesia we have utilized pentothal-curare solutions in all the cases except one where spinal anesthesis supplemented with pentothal-curare solution was used. Regarding the incision, we have utilized both a left hockey stick (Hochnegg) or more recently, a left paramedian incision from the symphysis pubis well up into the epigastrium. In our first two cases the hockey stick incision was used because we anticipated some difficulty mobilizing the splenic flexure but we noted in these and subsequent cases that the splenic flexure was very mobile and offered no problem in mobilization. Where the paramedian incision has been used care has been taken to keep the rectus muscle intact.

Extent of Resection

We have determined the proximal extent of resection in all cases preoperatively by means of roentgenograms. We have felt secure in utilizing for our anastomosis that segment of bowel which shows good haustral markings and peristaltic activities. In six of our cases this level of proximal transection has been in the right half of the transverse colon and in the remaining one in the ascending colon just proximal to the hepatic flexure. In all instances we have come proximal to the most distal area of active peristalsis. We have done this purposely so as to avoid any error in utilizing bowel of questionable peristaltic activity. The distal line of resection has been in the upper rectum. The bowel between the proximal and distal line of resection has been removed with careful ligature of the vessels in the mesentery. Definition of the normal rectal ampulla has been made in all instances without difficulty. We have insisted upon as little dissection of the rectum as possible for two reasons, firstly, because of the possibility of interference with the nervi erigentes and secondly, a large space left between the rectum and hollow of the sacrum predisposes to perirectal infection and leakage at the line of anastomosis. In the one patient in whom the space between the rectum and sacrum was opened widely, a leak of the anastomosis occurred and a deviating colostomy became necessary. A closed one layer type of anastomosis has been made using Wangensteen's intestinal anastomosis clamps[85]. Interrupted 40 silk sutures inserted in the Lambert fashion have been used. Because of the good length of the rectal stump there have been no particular technical difficulties with the anastomoses. The level of anastomoses has been between 6 and 10 cm from the anal skin. After the anastomosis has been completed a rubber catheter is introduced from below and placed into the proximal colon for decompression purposes. Great care has been taken to extraperitonealize the anastomosis. In two patients we have had difficulty in bringing down the transverse colon to the rectum because the distance between the upper abdomen and pelvis is greater than normal in patients with megacolon. In these patients the mid colic artery was clamped at its origin and after the collateral circulation was found to be good the vessel was transected and tied. This resulted in the needed additional length to do the anastomosis without tension. No attempt has been made to close off the bare areas made by removing the descending and sigmoid colons and their respective mesenteries. One gram of Streptomycin and 500,000 units of penicillin have been deposited routinely within the peritoneal cavity, at the level of anastomosis before closure. A nasal tube has been left into the stomach for decompression purposes for approximately forty-eight hours after operation. Closure of the abdominal wound in layers has been carried out using interrupted 30 silk (deknatal). Postoperatively these patients have received parenteral fluids, dihydrostreptomycin and penicillin for the first four days. Early ambulation has been practised. The rectal tube has been partly removed on the third day and completely withdrawn on the fourth. The urinary catheter has been left in until the fourth day, then removed and reinserted if the residual urine measures more than 75 cc.

Results

Seven patients have been operated upon in the manner described above. There have been no deaths. One patient developed a leak at the line anastomosis which necessitated a proximal deviating colostomy. The remaining six patients have had uncomplicated postoperative courses with excellent clinical results, having spontaneous daily bowel movements without the aid of enemas or cathartics. The period of follow-up ranges from 4 to 23 months. Postoperative barium enemas have been obtained in five of these patients and show good peristaltic activity and emptying of the residual colonic segment. There has been a marked improvement in the general health, physical endurance and personality in all the patients operated upon. In those patients who are still in the growing period there has been a rapid increase

in height and weight. The results to date in these patients both from the standpoint of the patients' response as well as the sincere thankfulness of the parents who had the problem of taking care of them before operation have made this operative procedure be a most gratifying one to the surgeon, second perhaps only to the Ramstedt operation for hypertrophic pyloric stenosis.

Case Reports:

was first seen at the University Hospitals in June 1945 at the age of 5 weeks. At that time he presented symptoms suggesting intestinal obstruction and had a laparotomy. A volvulus was found and 10 inches of the sigmoid colon were resected leaving a double-barrelled colostomy. The colostomy was closed in approximately two weeks and the patient developed marked abdominal distention. Exploration of the abdominal cavity was carried out again, approximately one week after closure of the colostomy at which time the anastomosis was found to be patent but there was marked dilatation of the bowel proximal to line of anastomosis. No further resection or anastomosis was done at this time and the patient was treated by means of repeated enemas, cathartics, etc. and then discharged in September 1945 under reasonable good control. He was re-admitted in October of 1946 because of recurring bouts of abdominal distention and intestinal obstruction and a laparotomy was carried out at which time a diagnosis of congenital megacolon was made and a transverse colostomy was formed. Following this the patient improved considerably. He was well until May 1946 at which time the colostomy closed spontaneously and he again developed intestinal obstruction. He was readmitted and the colostomy opened and again his symptoms subsided. Because of colostomy retraction and intestinal obstruction, he was readmitted 6-27-47 at which time the transverse colon was brought up on anterior abdominal wall over two glass rods placed through the mesacolon with an effort to prevent retraction of the colon. This time it was noted that the transverse colon was markedly thickened and dilated. Proctoscopic examination revealed no definite evidence of obstruction at the line of anastomosis although there was some slight narrowing here. A number of 30 French catheter, however, passed readily through the anastomosis into the dilated colon proximalwards. A small portion of the transverse colon taken at this time for histological examination showed typical changes of Hirschsprung's disease. Following this transverse colostomy the patient got along nicely and was readmitted on 9-28-48 for closure of the colostomy. After closure of the colostomy the patient got along nicely until January 1949 when, at this time, he again developed vomiting and abdominal distention which could not be controlled by enemas. He was returned to the hospital for examination on February 15, 1949 at which time marked abdominal distention with visable peristaltic waves were readily noted. The rectum, however, was empty to examination and the flat plate of the abdomen showed marked distention of both large and small bowels. He was taken to the operating room and a proctoscope was passed through the line of anastomosis between the transverse colon and sigmoid colon and following this rapid decompression occurred. After active preoperative preparation, on March 3, 1949 the patient was again taken to the operating room the narrowed recto-sigmoid region was removed and an anastomosis was made between the transverse colon and rectum at a distance of 7 cm. from the anal skin. Postoperatively, the patient did well and was discharged on March 27, seventeen days postoperatively at which time he was having three to four loose stools per day, regularly. He failed to keep his appointments in our outpatient department and was not seen again, until November 20, 1950 at which time he was having two stools per day without any enemas and was very active and appeared normal in every way. He had gained 14 lbs. and had grown $7\frac{1}{2}$ inches since his operation. Examination revealed the previous laparotomy scars but no evidence of distention. Unfortunately it was not possible to obtain a barium enema at that time.

Comment

This patient presented the rather typical history of a patient with symptoms of intestinal obstruction beginning soon after birth who was treated for a volvulus of the sigmoid without a definitive diagnosis of megacolon being made until sometime later. While an anastomosis had been done between the transverse colon and the sigmoid and there was no definite evidence of obstruction at the line of the anastomosis still whenever his colostomy was closed, the proximal bowel distended and he developed symptoms of intestinal obstruction with marked abdominal distention. At his last operative procedure the previous anastomosis was found to be patent but there was a residual narrowed area of the recto-sigmoid approximately 5 cm. in length. This area was resected and the transverse colon was brought down to the rectum. This experience is similar to that noted by others who have anastomosed the transverse colon to what appears to be normal sigmoid. Following removal of the narrowed sigmoid area, although the same proximal colon was utilized, still by anastomosing it to the rectum distal to the narrowed area, the patient has apparently been cured of his difficulty. The fact that he has had no intestinal obstruction and is having daily bowel movements even though the rectum has been left behind would also substantiate the contention that it is not necessary to remove the rectum as long as the narrowed sigmoid area is removed and actively contracting bowel is brought down and anastomosed to the residual rectal stump.

____, a 21 year old while male who was admitted to the University Hospitals 9-28-49 and discharged on 10-8-49. He was first seen at the University Hospitals in 1930 with the history of chronic constipation and abdominal distention since birth. He was acutely ill at this time with a high fever, vomiting and intestinal obstruction but was treated successfully by means of hot water enemas administered by Dr. A. Freidell of our pediatric staff. He was carried along reasonably well by means of medical therapy consisting of daily enemas, use of cathartics and for a period of time, he also received mecholyl without any prolonged relief, however. He was first seen by us for the consideration of surgery on 8-29-49 and although he was having daily evacuations, by means of enemas, he felt that he could no longer go to school because he was unable to handle the problem of self administration of enemas away from home. He was admitted on 9-28-49 and physical examination revealed a rather marked abdominal distention and marked flaring of the costal margin. Roentgenograms of the large bowel revealed the typical narrowed area in the region of the distal sigmoid and also marked dilatation of the proximal colon. After emptying, however, good peristaltic waves in the region of the ascending colon were noted. After adequate preoperative preparation he was explored on 9-29-49, at which time, the sigmoid colon was found to be tremendously dilated and thickened. This process extended to the proximal one-third of the transverse colon where a transformation from the abnormal to normal texture of the bowel occurred. The narrowed area of the rectosigmoid was about 7 to 8 cm. but distal to this the rectal ampulla had a normal transverse diameter. Resection of the colon distal to the hepatic flexure down to the rectal stump was carried out, anastomosis then made between the ascending colon and the rectum, about 7 cm. from the skin margin. Postoperatively he did very well and developed spontaneous bowel movements which were at first quite liquid but within a period of a month after operation they had become quite well formed. He was last seen on December 11, 1950, at which time he was having 2 to 3 well formed stools per day and had gained approximately 14 lbs. since surgery. He has been able to go to school and also has part time employment handling both responsibilities without difficulty. A roentgenogram of the bowel, after barium enema on December 11, 1950 showed excellent contractility and emptying of the residual colonic pouch.

Comment

This patient was the oldest in our present group and although he had been getting along relatively well by the use of daily enemas, he could not continue his schooling away from home because he was unable to arrange for self-administered enemas. The involvement of the bowel as determined by means of roentgenograms apparently extended to the proximal one-third of the transverse colon but in order to insure an actively contracting colonic segment for the anastomosis it was necessary to utilize the ascending colon and to anastomose this to the rectum. His response, postoperatively, has been most gratifying and he is now able to continue his schooling and in addition is well enough to hold down a part time job as well.

., a sixteen year old, white male was admitted to the University Hospitals on 10-23-49. This patient gave a history of constipation since birth requiring enemas for daily evacuation. A diagnosis of congenital megacolon was made and at the age of three (in 1936) a lumbar sympathectomy was done at Mayo Clinic. This was followed by relief for three weeks but the original symptoms of constipation reappeared. He developed intestinal obstruction and generalized convulsions in June of 1940 and was treated by means of intestinal decompression and vigorous use of enemas. He was placed on mecholyl but because of reactions and because no spontaneous evacuation of the bowel occurred the medication was discontinued. By means of enemas it was possible to produce daily evacuation of the bowel as well as to prevent any marked distention. However, because of the need for these daily enemas the youngster could not participate actively in the usual social and athletic endeavors of his companions of the same age group and he had become rather moody and presented a behavior problem to his parents. X-ray examination of the large bowel revealed considerable spasm of the sigmoid colon with marked dilatations of the descending and transverse portions of the colon. There was also considerable elevation of both leaves of the diaphragm. In spite of the dilatation of the right side of the colon, good peristaltic activity and haustral markings could be made out in the ascending and right half of the transverse portions of the colon. On 10-26-49 laparotomy revealed a normal rectum, measuring 6 cm. in transverse diameter but beginning in the retrosigmoid area and extending 14 cm. to 15 cm. proximally was a narrow segment of bowel with a diameter of approximately 2 cm. The colon proximal to this was markedly dilated and hypertrophied. The haustral markings of the external surfaces were absent being replaced with a continuous surface layer of opaque material. These changes in the bowel extended to the middle portion of the transverse colon, where the bowel wall although somewhat thicker and more dilated than normal had well defined longitudinal muscle bands and haustrations. The transition of the abnormal to normal external surfaces of the bowel corresponded rather closely to the area where the haustral pattern and peristaltic activity appeared to be normal roentgenographically. Balloons were placed into the transverse colon, dilated sigmoid colon and the narrowed rectosigmoid region. Although some small peristaltic waves were obtained, still the interpretations of these tracings were difficult to evaluate. The colon from the junction of the proximal 1/3 and distal 2/3 of the transverse colon down to the rectal ampulla was resected and an anastomosis between the transverse colon and the rectum was made at approximately 9 cm. from the anal skin margin. Postoperatively the patient did very nicely and was discharged on the tenth postoperative day having two or three soft well formed stools spontaneously. He was followed in our outpatient department and on his last visit one year after operation he was having two stools of almost normal size and consistency per day. He had gained almost 20 pounds in weight, had grown two inches, and no longer presented a behavior problem to his parents. Postoperative films taken six months after surgery revealed good contractility and evacuation powers of the residual segment of the colon.

Comment

Following operation this 16 year old boy developed spontaneous bowel movements, gained 20 pounds in weight and 2 inches in height within a period of a year. Because he could not participate in social and athletic activities with his companions he was no longer the serious behavior problem he had been to his parents before operation.

was admitted to the University Hospitals on 1-3-50 and discharged on 1-24-50. This eleven year old white male had marked constipation and abdominal distention since birth. He was first seen at the University Hospitals at the age of three when a diagnosis of congenital megacolon was made. He was place on medical therapy consisting of 200 milligrams of mecholyl one-half hour after breakfast, mineral oil by mouth nightly and mineral oil enemas as needed for relief from fecal and gaseous distention. By careful attention to details of this regimen the youngster's parents were able to prevent marked abdominal distention and to effect daily evacuation. On several occasions, however, it was necessary to hospitalize him for episodes of acute intestinal obstruction which were relieved by means of vigorous use of enemas as well as the insertion of the rectal tubes. For almost a year prior to his last admission to the University Hospitals, however, the management of the gaseous distention had become increasingly difficult. It was necessary for him to lie down once per hour daily to expell the gas which distended his abdomen. Also because of increasing distention his appetite had become impaired. He had not been able to go to school and it had been necessary to hospitalize him in his local community on several occasions for evacuation of his bowels. Physical examination upon admission revealed a thin, pale, poorly developed young white male, weighing 85 pounds and 53 3/4 inches in weight. There was marked flaring of the costal margins and great abdominal distention. Large loops of bowel could be readily seen beneath the distended anterior abdominal wall. After thorough cleansing of the bowel a roentgenogram revealed an area of constriction at the rectosigmoid junction with marked dilatation of the sigmoid, descending and left side of the transverse portion of the colon. Proximal to this, however, the bowel was of a smaller caliber and appeared to show good normal haustrations as well as active peristaltic waves. On 1-10-50 the patient was operated upon at which time the dilated sigmoid, descending and lateral or distal one third of the transverse portions of the colon along with the narrowed rectosigmoid were excised. The latter was 8 cm. long. The transverse colon was then brought down and anastomosed to the rectum at about 7 cm. from the anal margin. Postoperatively, the patient did nicely and began to have spontaneous semi-solid stools on the fifth postoperative day. He was discharged on the thirteenth postoperative day with the wound well healed and having soft but formed stools three times per day. About ten days after his discharge from the hospital he failed to pass any stool and developed abdominal distention. He was proctoscoped at that time and although some narrowing was noted at the line of anastomosis a number 30 French rectal tube could be passed without difficulty. He was admitted to the hospital for observation and the rectal tube which had been passed at proctoscopy was left inserted. He was given sitting up exercises to strengthen his abdominal muscles and instructed to go to the bath room immediately after breakfast. He again started to have spontaneous bowel movements and after further observation for another week, during which he had almost normally formed stools daily it was felt that it would be safe to discharge the patient. Following this discharge from the hospital, he did very nicely having spontaneous daily bowel movements of almost normal caliber without any further episodes of partial obstructions. Seven months after the operation at further check-up it was noted that he had gained approximately ten pounds in weight and had grown six inches. X-ray of the large bowel showed active peristalsis and good emptying of the residaul colonic segment.

Comment

This 11 year old patient had a temporary but incomplete obstruction following surgery but after exercises to strengthen the abdominal musculature and establishing a daily bowel evacuation pattern he had no further difficulty. In seven months after operation he had gained 20 pounds and grown 6 inches.

. . ., a two year old, white male was admitted to the University Hospitals on 3-27-50 and discharged on 5-3-50. The history given by the mother revealed that the patient had never had a spontaneous bowel movement since birth and it was necessary to give him soap suds and oil enemas every third day. Various laxatives, such as, castor oil, "castoria." and mineral oil had also been used but without any great success. The mother had also dilated the baby's anus with her finger daily at the advice of her doctor, but this had not apparently produced any beneficial results. Examination on admission revealed a pale, thin youngster with marked abdominal distention. Roentgneograms of the abdomen revealed marked gaseous distention of multiple intestinal loops. A barium enema done by the referring physician revealed the presence of marked dilatation of the sigmoid colon with a short narrowed rectosigmoid portion. The rectum appeared to be of normal character and had good contractility. He was given several blood transfusions, preoperatively. During the course of one of these transfusions the patient developed chills and a fever of 104°. All cultures of the blood were negative and repeat cross-matching showed compatilitity of the administered blood. The patient had a persistent fever for almost a week after transfusion. After the fever had subsided the patient was operated upon on 4-4-50 at which time it was noted that the sigmoid and descending portion of the colon were remarkedly dilated with obliterations of the haustral markings. The proximal portions of the transverse colon, the ascending colon and the cecum were dilated but the haustral markings were well-defined and the bowel was thin walled. The narrowed area between the rectum and sigmoid was extremely short, measuring only about 4 cm. The urinary bladder was markedly dilated as was the gallbladder. The stomach, small bowel were, however, within normal limits. The lateral one-half of the transverse colon, descending and sigmoid portions of the colon were removed and an anastomosis was then made between the transverse colon and the rectum at 6 cm. from the anal skin. During the dissection of the rectum a larger space than usual was opened between the hollow of the sacrum and the rectum. Although the anastomosis appeared to be a good one, there was difficulty inoobliterating the space between the sacrum and the rectum and this was not accomplished completely. The anastomosis was extraperitonealized and the abdominal wall closed in routine fashion. Postoperatively, the youngster did well apart from the difficulty in voiding and it was necessary to leave the in-lying catheter for a period of a week. On about the fourth postoperative day he developed a spiking temperature ranging to 104° F. which persisted daily in spite of intensive antibiotic therapy. On 4-16-50 a small transverse incision was made behind the anus and by means of a blunt dissection, the space between the rectum and the sacrum was entered and a large amount of pus was obtained. This abscess was obviously due to a breakdown of the anastomosis. After drainage, in order to deviate the fecal stream, a colostomy at the level of the hepatic flexure was done. After this procedure the temperature subsided and the patient gradually improved. He was discharged on 5-3-50 and was asked to return in three months. At this time a barium enema showed no evidence of fistula so an attempt was made to close the colostomy. Immediately following the closure of the colostomy the patient developed a spiking temperature, abdominal distention and watery diarrhea. A review of the x-ray plate which had been interpreted as being negative for a fistula, on re-examination showed a communication between the rectum and the space posteriorly in the hollow of the sacrum. Consequently, it was necessary to re-open the colostomy and the patient was discharged on 8-31-50 with

the colostomy draining nicely and his temperature within normal limits. A recent communication (12-9-50) from the patient's mother indicates that he is getting along nicely; having spontaneous bowel movements per colostomy. We plan to admit him again in six months and check him once more, carefully, for evidence of fistula at the line of anastomosis. If healing has occurred at the site, the colostomy will be closed.

Comment:

This patient is the only one in our series who developed a leak at the line of anastomosis. The opening of the large space between the hollow of the sacrum and the rectum, we feel, is an important factor in the development of the fistula. In all our other cases wh have taken care only to mobilize enough of the upper rectum to permit a ready anastomosis and we have had no disruptions of the line of anastomosis.

was admitted to the University Hospitals 7-26-50 and discharged on 8-29-50. This five year old white male had a history of marked abdominal distention and failure to have spontaneous bowel movements since birth. He needed daily enemas to produce bowel evacuation and to control abdominal distention. Examination on admission revealed a well-developed somewhat pale young boy with markedly protuberant abdomen. Peristaltic waves could be noted through the thin abdominal wall and fecal filled redundant loops of bowel could be readily palpated. After adequate preoperative preparation the patient was operated upon on 8-15-50 at which time the colon distal to the junction of the right 1/3 and left 2/3 of transverse colon to the upper level of the rectum was removed. An anastomosis was then effected between the transverse colon and the rectum at 8 cm. from the anal skin. The narrowed area of the rectosigmoid area measures approximately 6 cm. in length. Postoperatively the patient did nicely and was discharged on the fourteenth postoperative day having two to three well-formed soft stools per day. At a postoperative visit on 11-15-50 it was noted the patient had grown $2\frac{1}{2}$ inches and had gained three pounds since discharge from the hospital three months previously. He was having between three and five semi-solid stools spontaneously. A barium enema on 11-16-50 revealed good contractility and evacuation of the remaining portion of the colon and lower ileum.

Comment:

This patient had an uncomplicated postoperative course and has had an excellent result in that he is having daily spontaneous bowel movements and has grown about $2\frac{1}{2}$ inches in a period of three months.

, A nine year old, white male. was admitted to the University Hospitals on 9-18-50 and discharged on 10-14-50. This patient gave a history of marked constipation and inability to have spontaneous stools without the use of enemas since birth. He had failed to grow and gain in weight at a normal rate, although his mental development was good. Physical examination revealed a small, thin, pale white boy about the size of a five year old, with marked abdominal distention, and flaring of the costal margin. Fecal filled masses within loops of colon could be felt reallily through the thin abdominal wall. After adequate preoperative preparation the patient was operated upon on 10-5-50 at which time a normal rectum and a narrowed segment of sigmoid 8 cm. long were found. Proximal to this there was marked dilatation and hypertrophy of the colon extending to about the middle portion of the transverse colon. At this site there was a rather sharp change from the dilated colon to almost normal appearing transverse colon and ascending colon. The left side of the colon from the mid-transverse colon down to the upper portion of the rectum, was resected without difficulty and an anastomosis was then made between the rectum and the transverse colon at approximately 7 cm. from the anal skin margin. Postoperatively the patient did very nicely and was discharged on the ninth postoperative day having three soft but well-formed stools per day.

His postoperative progress has continued to be good with spontaneous stools daily and a definite improvement in his general health, appetite and weight gain of approximately five pounds. Postoperative barium enema revealed excellent filling and emptying capacities of the residual colon segment.

Comment:

This nine year old boy had the typical history and physical findings of congenital megacolon. Following segmental resection of the colon and anastomosis of the mid-transverse colon to the rectum, he has done nicely.

Summary and Conclusions:

I. A review of the historical, etiological and pathological features of true congenital idiopathic megacolon (Hirschsprung's disease) i.e., has been presented.

II. Careful x-ray studies of the colon in 7 patients with segmented megacolon reveal

1. A normal rectum.
2. A narrowed segment of recto-sigmoid and sigmoid portions of the colon of variable length.
3. Marked dilatation of the colon proximal to the narrowed area.
4. Active peristalsis and normal haustration of ascending and right side of the transverse colon.
5. Absence of peristaltic waves and haustration from the left side of the transverse descending and sigmoid portions of the colon.

III. A one stage transabdominal operative procedure is described, in which the narrowed terminal segment of the sigmoid and portions of the colon showing no peristalsis roentgenographically are removed. The residual part of the large bowel which has good peristaltic activity is then anastomosed to the upper portions of the rectum at a distance 6 to 10 cm. from the anal skin margins.

IV. The above described operation had been done on 7 patients without a death. Six patients have had excellent results postoperatively while the remaining one developed a leak at the line of anastomosis necessitating a proximal colostomy which up to the time of this publication has not been closed.

V. The saving of the rectum is of importance, because it eliminated the question of damage to the nervi erigentes, which is a deterrent to wholehearted acceptance of those operative procedures in which the rectum is removed.

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## II. MEDICAL SCHOOL NEWS

### Coming Events

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| January 4 - 6 | Continuation Course in Geriatrics for Physicians |
| January 22 - 26 | Continuation Course in Ophthalmology for Specialists |
| Jan. 29 - Feb. 10 | Continuation Course in Clinical Neurology for General Physicians, Internists, and Pediatricians |
| February 15 - 17 | Continuation Course in Cardiovascular Diseases for General Physicians |

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### Geriatrics Course

Outstanding visiting faculty members who will participate in a continuation course in Geriatrics to be presented January 4 - 6 include Dr. William Dock, New York University Medical Center; Dr. Albert I. Lansing, Washington University School of Medicine, St. Louis, Missouri; Dr. Nathan W. Shock, National Heart Institute, Baltimore, Maryland; Dr. Edward J. Stieglitz, Washington, D. C., and Dr. E. L. Tuohy, Duluth, Minnesota.

Both lay and professional people interested in the problems of geriatrics are cordially invited to attend a dinner in the main ballroom of the Coffman Memorial Union on Friday, January 5. Dr. Edward J. Stieglitz will speak on the subject, "Emotional Hazards of Senescence." Mr. Gideon Seymour, Executive Director of the Minneapolis Star and Tribune, will speak on the subject, "Can our Aged be an Asset?" Dr. Ancel Keys, who will preside at the dinner, will also call on Dr. Harold S. Diehl for a greeting from the University of Minnesota. Husbands and wives are welcome. Tickets may be obtained at $2.00 per place by writing to Dr. G. N. Aagaard, 3330 Powell Hall.

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### Progress Note

Latest word on the Variety Club Heart Hospital indicates that the dedication will probably be held around March 20, 1951. The hospital, when completed, will greatly expand the Medical School's facilities for patient care, research, and teaching in the field of cardiovascular diseases. In addition to 78 hospital beds for in-patient care, there will be a well-equipped Heart Clinic to care for both pediatric and adult out-patients.

Offices for physicians, nurses, social service workers, and administrative personnel will also be provided. Research laboratories will afford an opportunity to further research in such important disorders as rheumatic fever, congenital heart disease, hypertension, and arteriosclerosis.

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### Faculty News

Dr. Wallace D. Armstrong will be chairman of the conference on "Metabolic Interrelation" to be held in New York City on January 8 and 9. The conference is sponsored by the Josiah Macy, Jr. Foundation.

Dr. Edmund B. Flink attended the recent conference on ACTH held in Chicago under the sponsorship of the Armour Company.

Dr. Wesley W. Spink recently addressed the Los Angeles Society of Internal Medicine. The subject which Dr. Spink presented was "Brucellosis: Diagnosis and Treatment."

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### Holiday Greeting

The editorial staff of the Bulletin express our earnest hope that this will be truly a Merry Christmas and Happy New Year for all Foundation members, students, alumni, faculty, and friends of our Medical School.

III. UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
CALENDAR OF EVENTS

Visitors Welcome

December 24 - December 30, 1950

Sunday, December 24

University Hospitals

9:00 - 10:00 Surgery Grand Rounds; Station 22.

10:30 - Surgical Conference; Todd Amphitheater.

Monday, December 25 (Holiday)

Tuesday, December 26

Medical School and University Hospitals

9:00 - 9:50 Roentgenology Pediatric Conference; L. G. Rigler, I. McQuarrie and Staffs; Eustis Amphitheater, U. H.

9:00 - 12:00 Cardiovascular Rounds; Station 30, U. H.

12:30 - 1:20 Pathology Conference; Autopsies; J. R. Dawson and Staff; 102 I. A.

3:15 - 4:20 Gynecology Chart Conference; J. L. McKelvey and Staff; Station 54, U. H.

4:00 - 5:00 Pediatric Rounds on Wards; I. McQuarrie and Staff; U. H.

Ancker Hospital

8:00 - 9:00 Fracture Conference; Auditorium.

1:00 - 2:30 X-ray Surgery Conference; Auditorium.

Minneapolis General Hospital

8:00 - 9:00 Pediatric Rounds; Dr. Adams; 4th Floor.

8:30 - Pediatric Allergy Rounds; Dr. Nelson; 4th Floor.

9:00 - 10:00 Pediatric Rounds; F. H. Top; 7th Floor.

Veterans Administration Hospital

8:45 - Surgery Journal Club; Conference Room; Bldg. I.

8:30 - 10:20 Surgery Conference; Seminar Conference Room, Bldg. I.

9:00 - Infectious Disease Rounds; W. Hall.

Tuesday, December 26 (Cont.)

Veterans Administration Hospital (Cont.)

9:30 - Surgery-Pathology Conference; Conference Room, Bldg. I.

10:30 - 11:50 Surgical Pathological Conference; Lyle Hay and E. T. Bell.

10:30 - Surgery Tumor Conference; Conference Room, Bldg. I.

1:00 - Chest Surgery Conference; J. Kinsella and Wm. Tucker; Conference Room, Bldg. I.

1:30 - Liver Rounds; Samuel Nesbitt.

2:00 - 2:50 Dermatology and Syphilology Conference; H. E. Michelson and Staff; Bldg. III.

3:30 - 4:20 Autopsy Conference; E. T. Bell and Donald Gleason; Conference Room, Bldg. I.

Wednesday, December 27

Medical School and University Hospitals

8:00 - 8:50 Surgery Journal Club; O. H. Wangensteen and Staff; M-109, U. H.

8:00 - 9:00 Roentgenology-Surgical-Pathological Conference; Allen Judd and L. G. Rigler; Todd Amphitheater, U. H.

11:00 - 12:00 Pathology-Medicine-Surgery Conference; Surgery Case; O. H. Wangensteen, C. J. Watson and Staffs; Todd Amphitheater, U. H.

5:00 - 5:50 Urology-Pathological Conference; C. D. Creevy and Staff; Eustis Amphitheater.

5:00 - 7:00 Dermatology Clinical Seminar; Dining Room, U. H.

8:00 p.m. Dermatological Pathology Conference; Todd Amphitheater, U. H.

Ancker Hospital

8:30 - 9:30 Clinico-Pathological Conference; Auditorium.

3:30 - 4:30 Journal Club; Surgery Office.

Minneapolis General Hospital

9:00 - 10:00 Pediatric Rounds; Dr. Lowry; 5th Floor.

12:15 - Staff Meeting; Classroom, 4th Floor.

3:00 - 4:00 Pediatric Rounds; E. J. Huenekens; 4th Floor.

Wednesday, December 27 (Cont.)

Veterans Administration Hospital

8:30 - 10:00 Orthopedic-Roentgenologic Conference; Edward T. Evans and Bernard O'Loughlin; Conference Room, Bldg. I.

8:30 - 12:00 Neurology Rehabilitation and Case Conference; A. B. Baker.

11:00 - EKG Conference; Myocardial Infarct II; Reuben Berman; Conference Room; Bldg. I.

2:00 - 4:00 Infectious Disease Rounds; Main Conference Room, Bldg. I.

4:00 - 5:00 Infectious Disease Conference; W. Spink; Conference Room, Bldg. I.

7:00 p.m. Lectures in Basic Science of Orthopedics; Conference Room, Bldg. I.

Thursday, December 28

Medical School and University Hospitals

9:00 - 9:50 Medicine Case Presentation; C. J. Watson and Staff; M-109, U. H.

10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.

11:00 - 12:00 Cancer Clinic; K. Stenstrom and A. Kremen; Todd Amphitheater, U. H.

4:30 - 5:20 Ophthalmology Ward Rounds; Erling W. Hansen and Staff; E-534, U. H.

7:30 - 9:30 Pediatrics Cardiology Conference and Journal Club; Review of Current Literature 1st hour and Review of Patients 2nd hour; 206 Temporary West Hospital.

Minneapolis General Hospital

8:00 - Pediatric Rounds; Forrest Adams; 4th Floor.

9:00 - 10:00 Pediatric Rounds; F. H. Top; 7th Floor.

10:00 - Pediatric Rounds; Adult Contagion.

11:00 - 12:00 Clinical Pathology Conference; Large Classroom.

11:30 - Pediatric Conference; Main Classroom.

1:00 - 2:00 EKG and X-ray Conference; Classroom, 4th Floor.

2:00 - EKG and X-ray Conference; Classroom, Station I.

Veterans Administration Hospital

8:00 - Surgery Ward Rounds; Lyle Hay and Staff.

9:15 - Surgery Grand Rounds; Conference Room; Bldg. I.

Thursday, December 28 (Cont.)

Veterans Administration Hospital (Cont.)

11:00 - Surgery Roentgen Conference; Conference Room, Bldg. I.

1:00 - Chest Rounds; William Stead.

Friday, December 29

Medical School and University Hospitals

8:30 - 10:00 Neurology Grand Rounds; A. B. Baker and Staff; Station 50, U. H.

9:00 - 9:50 Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater, U. H.

11:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.

10:30 - 11:50 Otolaryngology Case Studies; L. R. Boies and Staff; Out-Patient Department, U. H.

1:00 - 2:50 Neurosurgery-Roentgenology Conference; W. T. Peyton, Harold O. Peterson and Staff; Todd Amphitheater, U. H.

2:00 - 3:00 Dermatology and Syphilology Conference; Presentation of Selected Cases of the Week; H. E. Michelson and Staff; W-312, U. H.

2:00 - 4:00 Physiology Conference; 214 Millard Hall.

3:00 - 5:00 Neuropathology Conference; F. Tichy; Todd Amphitheater, U. H.

4:00 - 5:00 Clinical Pathological Conference; A. B. Baker; Todd Amphitheater, U. H.

4:15 - 5:15 Electrocardiographic Conference; 106 Temp. Bldg., Hospital Court, U. H.

Ancker Hospital

1:00 - 3:00 Pathology-Surgery Conference; Auditorium.

Minneapolis General Hospital

9:00 - 10:00 Pediatric Rounds; Dr. Lowry; 5th Floor.

9:30 - Surgery-Pediatric Conference; O. S. Wyatt & T. C. Chisholm; 4th Floor.

Veterans Administration Hospital

10:30 - 11:20 Medicine Grand Rounds; Conference Room, Bldg. I.

1:00 - Microscopic-Pathology Conference; E. T. Bell; Conference Room, Bldg. I.

1:30 - Chest Conference; Wm. Tucker and J. A. Myers; Ward 62, Day Room.

3:00 - Renal Pathology; E. T. Bell; Conference Room, Bldg. I.

## Saturday, December 30

### Medical School and University Hospitals

7:45 - 8:50 Orthopedic X-ray Conference; Wallace H. Cole and Staff; M-109, U. H.

9:00 - 9:50 Medicine Case Presentation; C. J. Watson and Staff; E-221, U. H.

9:00 - 10:30 Pediatric Grand Rounds; I. McQuarrie and Staff; Eustis Amphitheater, U. H.

9:15 - 10:00 Surgery-Roentgenology Conference; J. Friedman, O. H. Wangensteen and Staff; Todd Amphitheater, U. H.

10:00 - 11:30 Surgery Conference; O. H. Wangensteen and Staff; Todd Amphitheater, U. H.

10:00 - 11:50 Medicine Ward Rounds; C. J. Watson and Staff; E-221, U. H.

10:00 - 12:50 Obstetrics and Gynecology Grand Rounds; J. L. McKelvey and Staff; Station 44, U. H.

### Ancker Hospital

8:30 - 9:30 Surgery Conference; Auditorium.

### Minneapolis General Hospital

8:00 - Pediatric Rounds; Forrest Adams; 4th Floor.

9:00 - 10:00 Pediatric Rounds; F. H. Top; 7th Floor.

11:00 - 12:00 Pediatric Clinic; Charles May; Classroom, 4th Floor.

### Veterans Administration Hospital

8:00 - Proctology Rounds; W. C. Bernstein and Staff; Bldg. III.

8:30 - Hematology Rounds; P. Hagen and E. F. Englund.