In these three cases there was at no time leukocytosis; a blood culture was made several times in the instance of the boy, with negative results, and in none was there more than a very slight fever; the pulse was variable. With the onset of the inflammation it is interesting to observe that there was tachycardia in one case for a day before dilatation occurred. Dilatation of the ventricle occurred suddenly and was associated with a slow intermittent pulse.

In the matter of treatment, the ultimate result to be expected in any case would depend largely on the degree and virulence of the inflammatory processes. It is advisable to reduce the work of the heart to a minimum by means of absolute rest, regulation of diet with a view to preventing distention of the stomach and colon and eliminating as much as possible a rise of blood pressure by the avoidance of hearty meals, use of the ice-bag, etc. The matter of rest is the most important of all. In fortunate cases this will result in a short time in diminution of the cardiac dilatation and will bring about conditions that most favor the subsidence of the inflammation. It is to be borne in mind that rest must be carried out with the utmost rigidity and the patient left as much as possible to the care of a suitable nurse. It is seldom desirable to separate a child from its parents, but the fewer people that enter the room the better. During the stage when inflammation is still present passive movements and massage have no place in the treatment. These measures, however, are of benefit when it is felt that the inflammatory process has disappeared and the myocardial irritability has sufficiently subsided.

The great aim in the treatment of such mild cases as here detailed is to prevent the increase of cardiac inflammation to such a point that there is the full painted picture of infectious endocarditis with its hopeless prognosis, and also to obtain a recovery before inflammation of a valve has gone to the point of such destruction as will result in scars of the valve segments and sooner or later a cardiac cripple. To that end it must be insisted on that the patient remain in bed a sufficient length of time, and a safe minimum is three months. Broadbent points out that a child with endocarditis dies, as a rule, before it attains adult life, especially if it does not receive that care which insures a complete subsidence of the inflammation, which may smolder for months, and a return of the heart to its normal size, also until the myocardium has lost its abnormal irritability and has regained such a sufficient margin of reserve strength as will prevent dilatation on slight provocation and will enable it to bear the burdens that a careless person may impose on it. Experience seems to teach that in adults acute endocarditis complicating inflammatory rheumatism is in many instances a very benign disease, recovery taking place in a much shorter time than is the rule with children. Valves already injured by previous inflammations present greater obstacles to a cure than inflammations occurring for the first time.

The use of vaccines is not unattended with danger.[14] In the first place the patient is already generating toxins theoretically sufficient without the addition of artificial vaccines. Again, when large numbers of bacteria are found in the blood, the use of vaccines may be attended with a reduction of the number of bacteria by destruction, but there are liberated at the same time toxins which result in an increase of the leukocytes and fever and a lowering of the condition of the patient. The same thing results in the use of foreign serums. It appears that the invading organism immunizes itself against the antibodies in the blood of the patient so that when foreign serum is introduced, although the number of bacteria may be diminished, the net result for the patient is bad. The use of cardiac stimulants is unnecessary so long as the proper amount of cardiac work is being performed, and it would seem rather advisable as long as possible to avoid stimulating the myocardium, already more or less degenerated from bacterial poisons, as the great desideratum is cardiac rest, not work. It is not to be denied that the use of small doses of digitalis may become necessary, but it will be observed that the heart muscle in endocarditis is very susceptible to the action of stimulants and even small doses of digitalis, for instance, may produce an irregularity before not present and which disappears on the cessation of the drug. Not only that, but in the presence of vegetations stimulation may cause a dislodgment and troublesome embolus.

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14. Billings, Frank: Chronic Infectious Endocarditis, Arch. Int. Med., November, 1909, p. 409. See also Note 13.

INTESTINAL OBSTRUCTION DUE TO SIGMOID VOLVULUS

WITH REPORT OF A CASE OCCURRING IN A CHILD

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In December, 1912, I reported a study of 191 cases of intestinal obstruction, exclusive of external hernia.[1] This series included 8 cases of sigmoid volvulus, all occurring in adult patients. Since that time I have added to the original group the records of 66 cases of intestinal obstruction, making the present number 257. Among the new cases is one of sigmoid volvulus occurring in a child of 6 years, which is herewith reported.

Acute obstruction is much more common in the small than in the large intestine, 201 to 56 being the proportion in this series. Volvulus of the sigmoid occurred 10 times in the series, making about 18 per cent. of the large intestine cases, and 3.8 per cent. of all forms of obstruction. Volvulus of the small intestine occurred 11 times, twice in children. Of the 257 cases, 41 occurred in children under 12. Eighteen of these cases were ileocecal intussusception, and 6 intussusception of the small intestine proper. Intussusception therefore makes up more than half of all the cases occurring in children, and is 8 times as common as all forms of volvulus in this class of patients.

Volvulus of the sigmoid occurring in a child is an unusual form of obstruction. As is usual when the obstructing agent interferes with the circulation in the mesentery the symptoms are severe and toxemia develops very rapidly after the onset of the obstruction. Therefore the passage from the first to the third or terminal stage of the disease may require but a few hours of illness.

A true volvulus of the sigmoid is probably impossible unless this portion of the colon is redundant. In all the cases studied this enlarged sigmoid is noted. The normal contour and close position of the footpoints of the sigmoid make a mechanical arrangement

1. McGlannan, Alexius: Intestinal Obstruction, THE JOURNAL A. M. A., March 8, 1913, p. 733.

especially favorable for the development of a twist when this loop of bowel is elongated. The feces collect in the loop, becoming more and more hardened as the constipation increases. Strong purgatives are usually administered to relieve this condition, and the resulting vigorous peristaltic movements forcing the contents of the distended loop of bowel against the fixed lower foot-point jam this outlet. Persistence of the force from above first makes the loop spastic and distended, and then sends the upper free portion in a spiral direction around the descending fixed portion.

Constipation is not necessarily a forerunner of volvulus. Any violent peristaltic action may cause the spastic contraction and the twisting movement of the long sigmoid loop.

The symptom of onset in sigmoid volvulus is abdominal pain, usually severe paroxysmal cramps, with or without previous constipation. Tenesmus with an inability to pass anything by rectum, except perhaps a little mucus, is often a secondary symptom. Blood may be present in the material expelled but the quantity is small and this sign is not at all frequently observed — a point of difference between the symptoms of volvulus and those of intussusception. An enema may be effectual, but if this does not relieve the pain or the nausea and vomiting which come on in a few hours after the onset, operation is indicated. The enema should be given through a long tube and with the patient in the knee-chest position.

The leukocytes are rapidly increased in number, reaching 25,000 or more in a few hours. In the 8 cases in adults studied the average was 23,000, the extremes 13,000 and 40,000. In the case occurring in a child the leukocyte count was 41,500.

Later on there will be distention with visible peristalsis, a palpable spastic coil in the lower abdomen, and then toxemia.

Operation should be performed in the early period of the obstruction, when it is safe to remove the redundant sigmoid and in this way prevent recurrent attacks. Simple relief of the volvulus is very likely to be followed by a recurrent obstruction. In one case of this series the patient had 32 attacks of obstruction and 3 laparotomies before his giant sigmoid was removed and a permanent cure effected.

The history of the case occurring in a child is the following:

The patient, a white girl, aged 6, was admitted to the children's ward of Mercy Hospital and examined in consultation with Dr. Edgar Friedenwald, who had at once recognized the acute surgical abdomen. The history was of two days' illness, the onset with cramps and diarrhea, followed by vomiting and tenesmus. No blood was in the movements. The patient was an anemic child, toxic, extremely listless, pulse rapid and thin; respirations thoracic and shallow. The abdomen was generally distended and tender. Muscle spasm and rigidity most marked in right lower quadrant. Dulness in both flanks. White blood count, 41,500, polynuclears 91 per cent.

Operation was performed immediately under novocain infiltration and ether anesthesia. A long right rectus incision was made. When the peritoneum was opened a large quantity of straw-colored fluid poured out. The small and large intestines were distended, but not inflamed. A hasty exploration of the right iliac fossa showed a healthy appendix and a greatly distended cecum. A much dilated loop of large bowel extended from the left over into the right lower abdomen. This loop was followed into the left fossa and proved to be the fundus of a sigmoid volvulus, which had twisted on its foot-points through an arc of about 300 degrees. This was untwisted, and a rectal tube passed through the anus by an assistant was guided by a hand in the abdomen up into the dilated loop. There was an immediate expulsion of gas and watery feces through the tube, with relief of the distention of the bowel. The abdomen was closed in layers, using fine silk sutures. The stomach was washed out and an ounce of castor oil given through the tube. Five hundred c.c. of salt solution and one dose of 1/200 grain atropin were given subcutaneously.

The patient was quite toxic for the first twenty-four hours after the operation and lavage of the stomach was required. After this time she improved steadily and in ten days was out of bed, the wound having healed.

Six weeks after the relief of the obstruction the second operation of resection and anastomosis was performed for the removal of the redundant sigmoid. The divided ends of the bowel were turned in and the anastomosis made by the method described by Bloodgood.[2] The turned in ends were sutured outside the parietal peritoneum and drains carried down to them. The muscles, fascia and skin were closed up to the drains.

Leakage from one end of the bowel occurred on the fifth day and prevented primary healing. The sinus closed spontaneously on the twenty-second day and the wound healed tight a week later.

As the child's home surroundings were very poor, she was kept in the hospital a month after the wound had closed. During this time she spent the days on the roof garden and was given increased nourishment. Her bowels moved daily without cathartics, her digestion was unimpaired and on her discharge she was in perfect health.

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GASTRIC AND DUODENAL ULCER

THE INFLUENCE OF OPERATIVE PROCEDURES ON GASTRIC MOTILITY AND SECRETION *

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It is generally conceded, both clinically and experimentally, that among the various factors responsible for chronic ulcer of the stomach, motor insufficiency and hypersecretion play the leading, if not the title, rôle. It follows that, in the treatment of ulcer, therapeutic procedures should be devised to control, so far as possible, these two important factors; in fact, the value of a given therapeutic measure can in a certain sense be gaged by its ability to restore the normal emptying time of the stomach (or to increase it) and to diminish the hyperacidity of the gastric contents.

Among various therapeutic measures instituted for the cure of gastric and duodenal ulcer, surgical procedures have been inaugurated in constantly increasing frequency. These surgical procedures are legion; they possess inexhaustible variations and modifications; they are constantly being supplanted by new models and new styles. Scant inquiry is devoted to the ultimate results of these operations, little thought to the permanent relief of symptoms, to the healing of the ulcer and the prevention of recurrences, and no consideration to gastric function, particularly gastric motility and secretion.

The present paper is a preliminary study of the postoperative results in a series of gastric and duodenal

2. Bloodgood: Ann. Surg., 1909, xlix, 161.

* From the medical and surgical services of the Michael Reese Hospital. Read at the first meeting of the Chicago Society of Internal Medicine, Feb. 22, 1915.