MESENTERIC THROMBOSIS *

WITH A REPORT OF 6 CASES

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Thrombosis of the mesenteric vessels is a condition of interest to the surgeon, not only because of its comparative rarity, but also because of its gravity, the difficulty of diagnosis, and the corresponding lack of success in its treatment.

Two cases of mesenteric thrombosis are noted in the records of the Lankenau Hospital in a period of ten years (1909 to 1919), during which time there were about 30,000 surgical admissions.

The anatomic points in this connection are well known and need be only hastily reviewed. The superior mesenteric artery alone supplies the small intestine and practically all of the large bowel with the exception of the descending colon, sigmoid, and rectum. The duodenum has a double blood supply. The superior mesenteric artery is stated to be an end artery, the inferior mesenteric is said not to be.

The superior mesenteric artery, then, is not only much more frequently the seat of the thrombosis, but the condition in this vessel or its branches should be correspondingly more serious than when it occurs in the inferior mesenteric area. The latter statement would be difficult of proof, because in either location the condition is of such gravity that recovery is extremely rare.

There seems to be no doubt that arterial blocking in the mesentery is far more common than obstruction of the venous circulation. Statistics have been given to show that it is twice as frequent (other authors state the ratio to be five to one).

In the reported cases there has often been no effort to differentiate between thrombosis of the mesenteric vessels and embolism. Indeed, this must often be impossible. The symptomatology is the same in either case and even at operation or autopsy it is difficult to determine whether in a given case we are dealing with a primary thrombotic or embolic condition. Venous conditions are, of course, thrombotic.

Arterial obstruction occurs either by embolic plugging of the vessel or thrombotic obliteration or by thrombosis developing at the site of lodgment of an embolus (Smith, *Wisconsin M. J.*)

Venous obstruction is said to be either of the ascending or descending variety. Whatever the nature of the beginning of the process, its course, prognosis, and treatment are the same.

There have been described also certain forms of vascular stoppage

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more chronic in character, but all of those with which the surgeon has to deal are acute in their course.

Perhaps of more interest as a classification is the division of these cases into those in which the process is the primary one surgically; *i.e.*, the one for whose diagnosis and treatment the surgeon is called, *vide* Cases I, II, III, IV, and V, or those in which the condition follows directly after some surgical condition (Case VI), already dealt with as a complication or secondary involvement.

A great deal of attention has been given to a consideration of symptoms and diagnostic points in connection with mesenteric thrombosis. Elaborate classifications and tabulations of histories and groups of cases have failed to bring out a symptom complex upon which even a probable diagnosis can safely be made in a fair percentage of the cases seen. It is true that in some of the instances, especially those that are post-operative, slow in onset and of the venous form of thrombosis, there are no symptoms which would even lead us to suspect the true condition interfering with the patient's recovery.

A consideration of the sequence of events in thrombotic conditions will at once point out the chief fact in symptomatology and diagnosis and one practically always overlooked.

When a thrombosis occurs, the blood supply of a certain segment of intestine is stopped or diminished to a great degree. With the diminution in blood supply of such a segment there comes the natural lessening of function, manifested as lessened peristalsis. If the segment of bowel affected be other than a very minute one, peristalsis ceasing in it soon causes stoppage, due to local paralytic ileus, and we find that the case develops the signs of intestinal obstruction. Of the further changes, gangrene, perforation, etc., little need be said. They are terminal stages only.

To repeat—the symptoms of mesenteric thrombosis, in so far as they may be grouped, are the symptoms of an acute intestinal obstruction.

We have not even arrived at a point of diagnostic skill that enables us to differentiate with certainty the variety of intestinal obstruction when such an obstruction is known to exist. How much more difficult it must always be to recognize definitely the occurrence of such a rare cause of diminished or absent intestinal action as mesenteric thrombosis. But we should always be able to recognize the fact that there has taken place a grave occurrence within the abdomen demanding immediately *definitely* planned and executed *surgical* attention.

In the five cases which I have to report pain is a prominent symptom as it is in every acute intestinal obstruction.

In Case I (Germantown Hospital, January, 1919) the patient was taken sick ten days before admission with a severe attack of abdominal pain in the region of the umbilicus, and then becoming general through-

out the abdomen. Similar (?) attacks have been noted for fourteen years prior to admission.

In Case II (Germantown Hospital, February, 1919) the attack began suddenly, with abdominal pain, nausea, and vomiting.

In Case III (Lankenau Hospital, 1915) the chief complaint is given as pain over whole abdomen. It is described in detail in the history as beginning seven days before admission as an epigastric pain of gradual onset, becoming worse three days after the beginning of the pain.

In Case IV the illness is described as beginning two days before admission with pain in the right lower abdomen, soon followed by vomiting. In this case the pain remained localized in the right lower abdomen.

In Case V (University of Pennsylvania Hospital, service of Doctor Deaver) the patient was seized with a severe pain in the epigastrium.

It is evident, then, that we have in all five cases a very definite history of pain as an early symptom, in only one of the instances described as of gradual onset.

A brief consideration of the case histories themselves will make plain the fact that these are cases of obstruction not often diagnosed.

CASE I.—Operated upon by my assistant, Dr. Wm. B. Swartley, at the Germantown Hospital. About ten days before admission the patient began with a severe attack of abdominal pain in the region of the umbilicus, radiation and becoming general, although worse near the midline and about the umbilicus. There was much tenderness and rigidity. The patient had not been constipated. Shortly after admission to hospital there was a peculiar looking tarry stool.

The patient states that for the last years she has had frequent attacks of severe abdominal pain, coming on suddenly, causing her to go to bed, and to be away from her duties seven to ten days. At these times the pain was located in the central part of the abdomen and in the right lower quadrant, the abdomen was sore and rigid, the bowels often constipated. She had anorexia and at times vomiting during these attacks. Such attacks occurred three to four times a year. The history otherwise is unimportant; no menstrual disturbances; one child, living and well.

Physical examination shows a fairly well-nourished woman of forty. The patient is extremely anæmic, but not jaundiced. The tongue is coated. The patient has pyorrhœa of a marked degree. Chest shows slight dullness over the apex of the right lung. No râles. The heart shows slight enlargement to left and a soft systolic endocardial murmur which is not transmitted. The abdomen is distended and tympanitic. Much general tenderness and rigidity on deep pressure and an area of dullness in the right flank suggesting fluid. No peristalsis is heard. No palpable masses or liver enlargement were found. The pain on pressure is slightly more severe to the right of the umbilicus. Vaginal examination negative. The leucocyte count on January 5, 1919, was 15,000; on January 6, 1919,

was 9000; hæmoglobin, 26; red blood count, 2,690,000. Occult blood test on fecal matter was negative on January 6, 1919, but a note on January 13th states that there were definite signs of intestinal hemorrhage. The urine showed a faint trace of albumin.

A right rectus incision was made and an appendix showing chronic obliterative appendicitis was removed. One foot of the lower portion of the ileum was found to be black and almost gangrenous, due to a thrombosis of the branch of the mesenteric artery supplying the portion of the bowel. There was a V-shaped infarcted area in the mesentery. The patient's condition did not permit of resection and the wound was closed and paitent put to bed. Under intravenous saline and stimulation the patient lived about four hours.

The appendix removed was 30 and 5 mm. The canal was obliterated. The coats white fibrous and thickened, and the appendix somewhat hooked, due to a shortening of the meso-appendix. This case shows several features of great interest. The history shows first a pyorrhœa, a possible original focus of infection. The condition of the removed appendix and the history suggest previous attacks of acute or subacute appendicitis. The heart murmur suggests a possible endocarditis and the original to be an embolus instead of a simple thrombosis of the mesenteric vessel.

The findings on admission show clearly the picture of a late stage of obstruction. The bloody stools and anæmia secondary to intestinal hemorrhage are said by some authors to suggest thrombosis. Such a marked anæmia, however, would be more likely to be taken, other things being equal, as pointing to possible malignant disease. Most striking, however, is the ten-day interval between onset and operation, rendering cure out of reasonable expectation.

CASE II.—Miss C. J., aged sixty years. The patient was admitted to the Germantown Hospital February 21, 1919, having first been seen on that day by Doctor Moxey, who at once realized the gravity of her condition. The patient was sent in with a diagnosis of acute obstruction—this being entirely correct. The patient when first seen by her physician had been ill about two days. The onset had been sudden, with severe abdominal pain, nausea, and vomiting. The patient had been constipated and had without avail used both purgatives and enemata.

Physical examination showed a heavily built woman evidently very ill, in fact, in extremis. She was dyspnœic and cyanotic. The abdomen was distended and tympanitic, but not rigid. No peristalsis, the patient complained of nausea, but there was no retching or vomiting. A fatty endocarditis may have been a factor in causing the respiratory embarrassment.

Operation was undertaken as a forlorn hope. The patient died before anything could be done to relieve her condition. The small intestine, for approximately 10 feet, was found to be gangrenous, swollen, but not markedly distended. The mesenteric arteries were thickened, rigid, hard, and thrombosed, and there was no demonstrable attempt at the formation of a collateral circulation. The cæcum

and ascending colon were thickened and distended and the hepatic flexure moderately bound down by adheisons but not obstructed.

This case shows the involvement of a far greater extent of gut than Case I, a complete shutting off of the blood stream and a fulminating course. Had this patient consulted a physician at once some hope could have been entertained for her, since her condition would have been evident at any time after the onset of the disease and early operation with resection might have been possible.

CASE III (Lankenau Hospital, operated on by Dr. John B. Deaver). —B. B., aged forty-six years, admitted February 13, 1917. Two days before admission the illness began with pain in the right lower abdomen. The pain continuing, after a few hours the patient began to vomit. He was given purgatives, but the patient's bowels did not move and the pain continued more or less constantly up to the time of admission. The patient complained of no fever or chill, but showed marked anorexia. His previous medical history notes: "Two previous attacks—one a month ago, and six months ago."

On admission the patient is seen to be fairly well nourished. The abdomen was somewhat distended with a tumor-like fullness in the right iliac fossa. There was rather marked tenderness and rigidity in the lower right abdomen where a mass was vaguely palpable. Peristalsis was present in the upper and left portions of the abdomen. Rectal examination revealed distinct tenderness to the right and very slight tenderness to the left side.

Operation—*four days* after admission—February 17, 1917. Under ether anæsthesia. A McBurney incision was made and enlarged upward; at a point a hand's breadth above the cæcum in the ascending colon, partial necrosis was evident, and on slight manipulation the bowel wall gave way and fecal material poured out into the field of operation. A glass drainage tube was placed in the pelvis and purulent fluid evacuated. A large rubber tube was placed in the rent in the ascending colon and the bowel closed about the tube and then sewed to the parietal peritoneum. Gauze was packed about the tube.

Peritonitis steadily became more marked after the operation and the patient succumbed.

Post-mortem inspection through the wound showed thrombosis of the mesenteric veins leading to the ascending colon.

The salient points of the history here cited are few but important. They are: (1) The simulation of an attack of acute appendicitis. The history is not typical but was sufficiently deceptive to have caused the postponement of operation for four days and the employment of a McBurney incision. (2) The early localization of symptoms correctly indicating the position of the abdominal lesion itself.

The operative procedure—drainage alone—was the correct one, the outlook hopeless at the time of operation.

CASE IV.—G. A., aged fifty-two years (Lankenau Hospital, case of Dr. John B. Deaver). Admitted October 22, 1915; died October 23, 1915. The patient's illness began seven days before admission with

pain in the epigastrium, gradual in onset. Purgatives were given and the patient's bowels moved freely. Three days after the onset of the illness the patient seemed to get worse and the whole abdomen became painful. The patient began to vomit dark material and vomited everything taken by mouth thereafter. No one spot could be given as the seat of the most intense pain. There was no jaundice or chill.

The previous history mentions frequent attacks of indigestion and the use of alcohol.

Physical Examination.—The patient is a very large man, evidently in great pain. Complexion sallow; tongue heavily coated. The abdomen is greatly distended and generally tender, this tenderness being more marked in the epigastrium and left lower quadrant. Peristalsis absent. Blood-pressure, 125–80.

The patient died twenty hours after admission, not being operated on. Autopsy showed mesenteric thrombosis with gangrene of the proximal four to six feet of ileum.

A rather concise history here shows an obstruction with a typical symptom at the onset unrecognized. Three days after the onset the severe obstructive and peritonitic manifestations render it evident that operative intervention could have accomplished nothing.

CASE V.—D. H. G., aged fifty-one years (University Hospital, operated on by Dr. John B. Deaver). Admitted September 25, 1918. The day before admission the patient was seized with a severe pain in the epigastrium. In the course of an hour or so this pain became generalized, affecting both the upper and lower right quadrant. The pain was paroxysmal in character, leaving the patient with a dull ache between the paroxysms. One such paroxysm of pain lasted an hour. The patient has vomited several times, once following a dose of magnesium sulphate and again following a dose of mustard water. No fecal vomiting. Bowels have not moved since beginning of illness.

Past medical history is unimportant as bearing on the present illness. Physical examination: The abdomen is tender and rigid in the epigastrium and the right iliac regions, the point of maximum tenderness being in the left upper quadrant. Little, if any, abdominal distention was present, but the upper abdomen was tympanitic on percussion. Auscultation shows peristalsis of an exaggerated and gurgling type. Blood examination: White blood count, 13,280; 76 per cent. polymorphonuclears.

After admission an enema was given with but slight result and no relief of symptoms. Lavage disclosed gastric contents having a decidedly fecal odor and appearance. A diagnosis of intestinal obstruction was made and immediate operation performed.

Operation by Dr. John B. Deaver. Ether anæsthesia. A right rectus incision was made. No mechanical obstruction was found, but there was a thrombosis of a branch of superior mesenteric artery supplying a segment of the ileum. There was considerable hemorrhage into the mesentery and a small amount of free blood in the

abdominal cavity. The segment of bowel affected was in fair condition, apparently being taken care of by the collateral circulation. Doctor Deaver expressed the opinion that no further surgical procedure would benefit the patient, and the operation was terminated. During the operation the patient received 750 c.c. of salt solution intravenously.

The first two days after operation were somewhat stormy for the patient, but after this he rallied and made an uneventful recovery.

He was discharged on the fourteenth day after operation, in very good condition. When last heard of through the family physician, he had had no return of symptoms.

This, the only case operated upon that recovered, is of note in several ways: (1) The correct diagnosis of intestinal obstruction, was made early and operation was performed at once. At operation good judgment based upon experience saved the patient from an extensive and uncalled-for procedure. The case proves, upon the living patient, a fact noted at autopsy; namely, that the collateral circulation, perhaps more often than would be supposed, has overcome the effects of mesenteric thrombosis.

CASE VI.—Mrs. C., aged thirty-seven years (Germantown Hospital). This patient had been operated upon for a pelvic condition. Intra-abdominally a cyst of the left ovary was excised, the appendix removed and the round ligaments shortened by the Gilliam method. There was also done a trachelorrhaphy and colporrhaphy, and perineorrhaphy. For six or seven days her convalescence progressed favorably. She had been catheterized regularly. Upon one occasion the nurse, after having by mistake introduced the catheter into the vagina, made the error of introducing it into the urethra without resterilizing it. The following day the patient had a well-developed septic cystitis; with a rise of temperature, chill and frequency of urination, with severe burning pain. Forty-eight hours later she had another chill with phlebitis of the left saphenous vein. The phlebitis continued an upward course into the iliac veins with involvement of the inferior mesenteric veins—through the middle hemorrhoidal vein which is the avenue of communication between the systemic and portal circulation. Her abdomen became distended and tympanitic and extremely tender. There was intense pain, nausea, and vomiting. The bowels were moved by enema and at no time did she show signs of intestinal obstruction.

Blood culture showed a colon bacillæmia. The diagnosis of thrombosis of the inferior mesenteric veins seems justified by the symptomatology and the sequence of events, although positive corroboration must be lacking because of the patient's recovery without a second operation.

A careful consideration of the foregoing case reports and of the numerous similar cases on record would lead us to a number of definite conclusions. They may be summarized as follows:

1. Arterial mesenteric thrombosis is a lesion causing a form of acute

intestinal obstruction, rare, but occurring with sufficient frequency to make it imperative to remember its possible occurrence.

2. Its symptom complex is that of an acute intestinal obstruction, slower in onset than the purely mechanical forms of acute obstructive ileus (adhesion, volvulus, etc.).

3. Venous mesenteric thrombosis is a condition of vaguer symptomatology and slower course than that formed in arterial obstruction. It tends more to spontaneous cure, and is more likely to be a secondary or post-operative condition. When, however, its remedy by the establishment of collateral circulation does not occur, it gives the same final symptoms as does the arterial form of obstruction.

4. The treatment of mesenteric thrombosis is the treatment of any form of acute intestinal obstruction—early operation. The procedure employed must vary with the condition found at operation.

(*a*) If the vitality of a segment of gut has been gravely affected, resection is indicated.

(*b*) If the patient's condition contra-indicates resection, the gut should be drawn out of the abdomen, fastened to the edges of the wound and a Paul's tube introduced, resection to be performed later.

(*c*) In the one case of this series that recovered nothing was done to the intestine and spontaneous cure resulted. While it is true that this may at times occur, and the judgment of the operator may indicate such a course, such isolated instances do not refute the general rule of early, radical procedure.

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