

JEJUNAL DIVERTICULA

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THE purpose of this communication is to place on record two cases of diverticulum of the upper third of the jejunum, in one of which the diagnosis was made by the X-ray and confirmed by operation wherein the diverticulum was removed with recovery of the patient and relief of symptoms, while in the other a diagnosis of appendicitis was made; a fatal result followed appendectomy and autopsy revealed a diverticulum.

Hitherto much has been written of diverticulosis of the colon and more recently of the duodenum. An article by William Mayo,¹ in 1917, covers the former, and articles by Case,² of Battle Creek, Roberts and Cole,³ and E. Willys Andrews⁴ within the past year cover the latter, so that a discussion of diverticulosis in general will not be attempted. It is because of the comparatively few cases on record of the particular lesion described, as well as the apparent fact that the condition comprises a clinical entity diagnosable and susceptible to specific relief by surgery, that we offer this report.

Referring briefly to Case's paper, we find that he was able to collect from the literature of the period 1854 to 1920 but seventeen cases in which diverticula of the jejunum were found at operation or autopsy. Of these four were single, and the rest multiple, one having four hundred sacculations. It is interesting to note that practically all are at or near the mesenteric attachment and when multiple may be associated with diverticula of other parts of the intestine and sometimes of the bladder.

To this list Case adds two detailed histories from his own experience, in both of which the diagnosis was made by X-ray and confirmed by operation. He also refers to three other diagnoses made, but which were not confirmed, as patients were not operated upon and therefore not included in his list. So far as we know, the honor of being the first to diagnose the condition prior to operation belongs to Case; we believe, however, that under the stimulation of his articles others like ourselves will find them out and one more "rare" condition will assume a position in the ranks of the relatively commonplace.

In support of our suggestion that the condition may be a clinical entity of some importance, we take the liberty to abstract the history of his first case, which was an adult male having a single large diverticulum near the duodeno-jejunal junction, in which the symptoms were "indigestion" for the preceding ten months, feeling of pressure and distention of stomach developing immediately after meals, causing much discomfort and distress, relieved

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somewhat by belching of gas, no pain, no nausea and no vomiting, but occasional "heart-burn" at two A.M. and intestinal flatulence. This large sac was associated with many small ones and was situated between the folds of the mesentery and devoid of muscularis. Treatment was resection of 30 cm. of the bowel.

CASE I.—E. C., male, aged fifty-four. Occupation, operative. His work required considerable sustained muscular tension but no direct pressure on abdomen. Admitted medical, December 12, 1920. Service of Dr. G. A. Tripp. Chief complaint: Stomach trouble.

Past history negative up to present illness, which dates from fifteen months ago, since when he has lost fifty pounds in weight and feels "run down." His trouble began rather abruptly with epigastric pain, developing one morning after he had begun work and thereafter about ten minutes to one hour after meals, more recently as apt to come on with stomach empty and to be eased by taking food, but returning soon after. The pain is located in middle epigastrium and radiates to right and back. Patient is sure that he observed blood in stool a week ago, has no hemorrhoids, has never been nauseated nor has he vomited at any time.

Physical examination: Well-developed and nourished man in fair general condition.

Central nervous system, heart, lungs, skin, genitals and extremities normal.

Abdomen: relaxed, soft, tympanitic; no area of localized tenderness, except rather vaguely deep in middle epigastrium. By rectum: Prostate is found slightly enlarged, no tenderness, swelling, hemorrhoids or fissure felt. Temperature, 96.8°. Pulse, 94. Blood-pressure, 90/60. December 18, 1920/76.

Urine: December 13, 1920, acid, 1034, no albumen, sugar or bile.

X-ray examination: (December 18th): Regular gastro-intestinal series. No abnormality shown in stomach or duodenum. In region of jejunum and shown on a series of plates is a shadow about size and shape of the duodenal cap. Diverticulum might produce such an appearance.—P. H. Cook.

Note.—Sac had nearly emptied on six-hour plate and entirely on twenty-four hour.

Progress: House diet with meat.

December 16th: Patient's gastric distress seems to be of an indefinite character, pain and distress may come on twenty to forty-five minutes after meals or in the evening on empty stomach. Still losing weight.

Blood chemistry December 22nd: Sugar, .11; creatinin, 1.1; urea nitrogen, 14; alkaline reserve, 65.

December 12th: Wassermann negative.

December 21st: Blood differential; polymorphonuclear, 76 per cent. Lymphocytes, 20 per cent. Eosinophiles, 3 per cent. Mast, 1 per cent. Reds show no abnormality; platelets present in average ratio to reds.

December 22nd: Whites, 7800; reds, 3,864,000.

December 15th and 18th: Examination of stools negative for blood. Phthalein test, December 16th, 58 per cent., two hours.

December 23rd: Urine, acid, 1032. No albumen; no sugar.

December 21st: X-ray examination repeated. Diverticulum shows as before, not visibilized by fluoroscope.—P. H. Cook.

December 24th: Transferred surgical. Operation December 29th.

Operation Record: Operator, Doctor Hunt; assistant, Doctor Baxley. Anæsthetic, ether; cone method, by Miss Fennell. Preoperative diagnosis: Diverticulum of jejunum (by X-ray department).

Description of operation: Right paramedian incision centering at level of umbilicus. Appendix pulled out and found to contain concretions and was removed. Systematic exploration of small intestine, beginning at ileocæcal junction and carried upward, found three inches below upper end of jejunum on the left side near the mesenteric attachment, a diverticulum roughly pear-shaped and approximately three cm. deep and three cm. broad. Dissecting peritoneum around its attachments, the communication with the intestine was found to be about 1 cm. in diameter. The diverticulum was clamped at the neck, tied off, amputated, and the stump buried by a double row of Lembert sutures, the mesentery on that side being hooked up by a large suture to serve as a buttress. This procedure was carried out with very careful protection of adjacent bowel by gauze. Wound closed layer by layer.

Condition of organs explored: Gall-bladder, duodenum, liver, stomach and colon normal. Condition of patient as to shock, hemorrhage; no apparent shock, no hemorrhage. Post-operative diagnosis same. Operation by name: Appendectomy, diverticulectomy.

Pathological report, December 29, 1920: Diverticulum of intestine, which on section shows a very thin muscularis with a thickened mucosa. The appendix shows moderate chronic fibrous changes.—Dr. F. H. Baker.

Progress: Convalescence was uneventful; patient discharged as "cured" January 17th, nineteenth day after operation.

Follow-up note: Returned to hospital April 1, 1921, having developed a ventral hernia in operation wound. Has gained twenty-two pounds in weight and had no recurrence of the symptoms which preceded the operation.

The outstanding features of the symptomatology in this case are: (1) Rather definite onset. (2) Rapid and considerable loss of weight. (3) Digestive symptoms consisting of pain and discomfort of rather uncertain character, but in general, corresponding to the period when the sac might be distended by partly digested food and radiating to the upper lumbar region. (4) Rather diffuse and inconstant tenderness in the neighborhood of the sac. The diagnosis depended upon the routine X-ray examination.

It seems remarkable that so well-formed a sac which would *a priori* seem to have existed much longer than symptoms attributable to it can be traced should suddenly become an active source of serious disturbance without having become subject to some superimposed condition such as ulcerative or in-

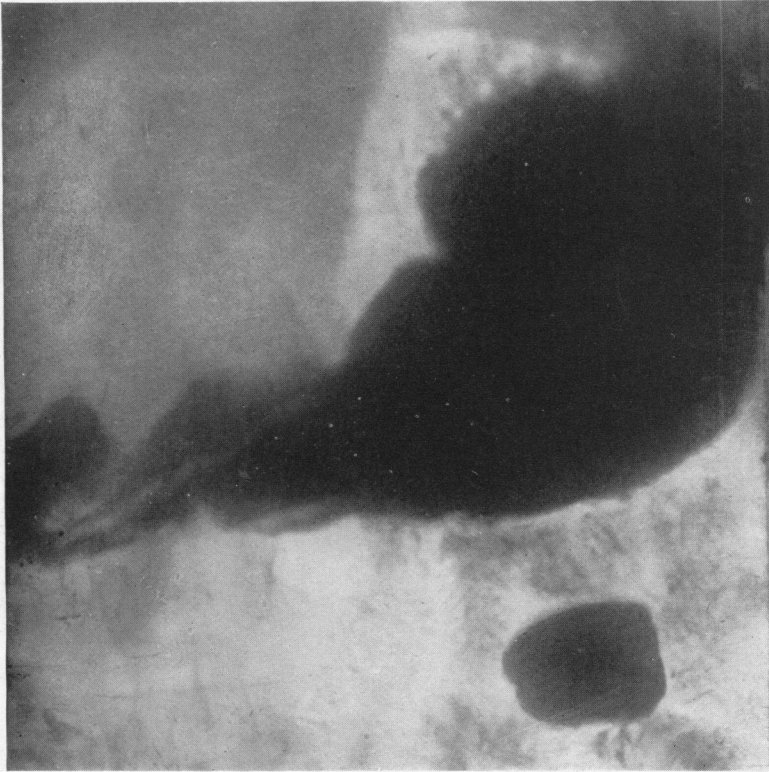


FIG. 1.— Röntgenogram of Case 1 showing diverticulum, with its relation to stomach and jejunum.

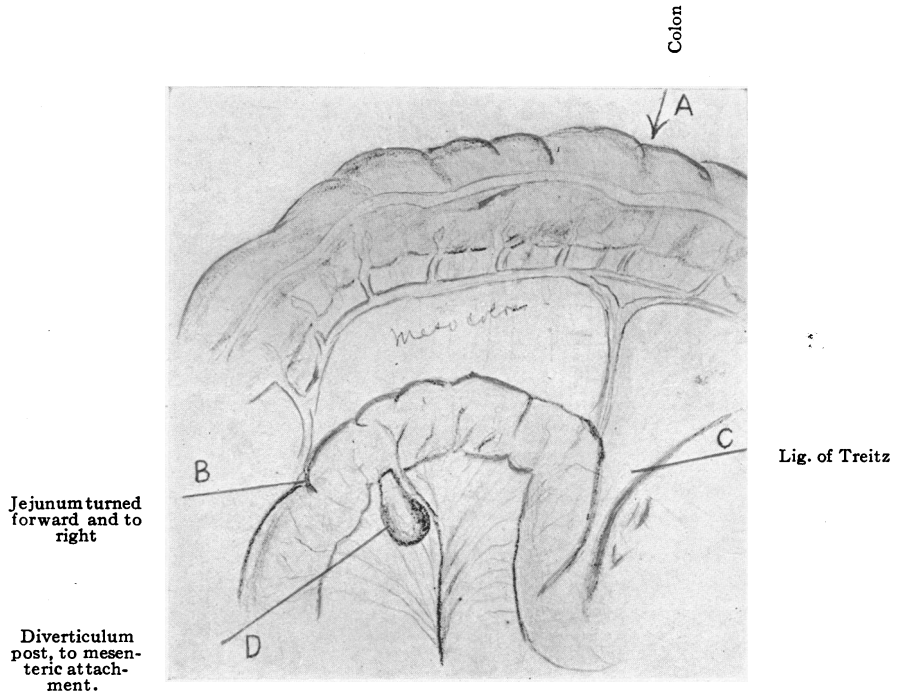


FIG. 2.—Sketch showing location of diverticulum and relations as found at operation in Case I.

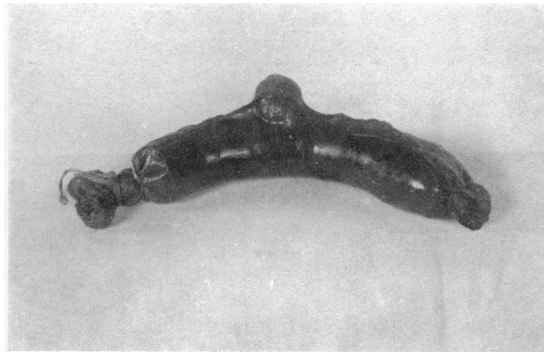


FIG. 3.—Section of jejunum from Case II, removed at autopsy, showing diverticulum protruding between cut edges of mesentery.

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flammatory changes. If we can assume a sudden development of such a lesion from mechanical strain, it becomes less puzzling. Doubtless herniation is a cause of many diverticula, as we not uncommonly find obvious herniation of mucosa in bowel distended from obstruction below and in such the muscularis is lacking in the sacculated portion. In this instance the muscularis mucosæ is present, but the muscularis itself is found only in segments at the point of section, which was at the side of the sac, hence it is possible that by slow pouching the mucosa was driven through a defect in the muscular layer near a point of penetration by the blood supply. The villi, glands of Lieberkühn, and solitary follicles are present as normally found in the jejunum, and there is no evidence of any inflammatory process. Symptoms must have been dependent upon distention when packed by intestinal contents and their development coincident with the attainment of a certain size in the pouching when immediate emptying was no longer possible.

Bearing these symptoms in mind and remembering the possibilities of ulcerative, suppurative and carcinomatous developments upon such a lesion, it seems probable that it will be more frequently considered in differential diagnoses and its true importance discovered.

The distinctive Röntgen findings in this case consisted of a well-defined shadow, of solid and constant density, uniform in its relation to the feathery coils of jejunum, yet movable independently of them. The "fluid level," mentioned by Roberts and Cole, was not observed.

CASE II.—(By courtesy of a colleague.) No. a-19666. Male, aged forty-four years, divorced, laborer in street department. Entered April 3, 1921.

Past History: Negative, except for malaria as a young man. Constipation associated with vertigo and diplopia recently. Habits described as good and venereal not recorded. No loss of weight or swelling of feet.

Present Illness: About twelve hours prior to entrance began to have sharp pains and general discomfort in abdomen, accompanied by dizziness and nausea, vomiting everything ingested during day. Throat negative. Chest: lungs negative. Heart: slightly irregular with roughened aortic first. No murmurs. Blood-pressure, 134/88. Pulse, 80. Temperature, 99°. White count, 8400. Hæmoglobin, 90 per cent. Abdomen: generalized tenderness in lower right and left quadrants with point of maximum tenderness two inches below McBurney's point. This tenderness is very acute on deep palpation. Urine: specific gravity, 1002; no albumen; no sugar.

Preoperative Diagnosis: Appendicitis, acute.

Operation (ether, cone method): Found a retrocæcal adherent appendix five inches long which was removed with some difficulty and stump cauterized. Pulse did not exceed 96. Good ether recovery.

April 4, 1921: During forenoon had difficulty in speaking, followed in afternoon by inability to swallow. Examination showed pharynx dry and insensitive with apparent paralysis of muscles of deglutition. Pulse remained of good character, 76. Temperature, 98.6°.

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April 5, 1921: Died suddenly at 3.50 A.M.

Cultures: Abdomen, no growth. Throat, no diphtheria. Pathological report: chronic appendicitis, no marked changes. Final diagnosis: (clinical) appendicitis, chronic. Acute bulbar paralysis.

Autopsy: Pia thickened and opaque over both hemispheres. Section of brain showed no gross lesion. Bronchi showed injection of mucosa with blood-tinged, frothy mucus. Lungs oedematous; moderate passive congestion of liver and spleen. Ecchymosis and a very little free blood about site of appendix; no peritonitis. Forty centimetres below upper end of jejunum, lying between folds of mesentery, is a diverticulum, size of an English walnut. Inflation of gut shows that its wall is much thinner than the intestinal wall. There is no surrounding inflammation. Kidneys enlarged, otherwise not grossly abnormal. Anatomical diagnosis: wound of recent appendix operation. Lepto-meningitis, chronic. Bronchitis, acute. Diverticulum of jejunum.

The cause of death in this case is obscure in spite of the autopsy. The low specific gravity of urine with oedema of lungs suggests a toxic condition, while lepto-meningitis is consistent with syphilis. A post-mortem Wassermann was negative.

Our reason for reporting it lies in the presence of the diverticulum. Could it not have been responsible for the symptoms attributed to the appendix? It will be noted that pulse, temperature and white count were but little disturbed, and while this is not extremely rare in very serious appendicitis, in this instance it may be interpreted as favoring the other hypothesis, moreover, the point of maximum tenderness was much below the actual level of the appendix.

We cannot go so far as to advise the administration of a barium meal in the face of an acute abdominal crisis with vomiting, nor do we consider the possibility of such a lesion as a contraindication for prompt operation in such an acute abdomen, but would suggest that in event of finding the suspected lesion absent or insufficient to account for the symptoms, diverticulum be kept in mind and the small bowel explored from end to end. In the less urgent cases and in obscure cases in general the possibility of these lesions should be carefully considered in the course of the routine Röntgen examinations of the gastro-intestinal tract.

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