

CONGENITAL MESENTERIC CYSTS.*

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THE rarity of mesenteric cysts, coupled with their interesting and by no means established *status* in pathological anatomy, entitles hitherto unreported cases to a place in the literary annals of the day.

On May 20, 1908, I operated upon the following little patient in the Children's Hospital of the Mary J. Drexel Home:

E. B., aged 7 years, school-girl, was admitted May 19, 1908, complaining of abdominal pain and vomiting. Two years previously she had suffered from a malady then diagnosed as gastritis. Two weeks before admission she suffered with abdominal pain and vomiting. Nine days later, her mother noticed a yellowish vaginal discharge. The pain and discharge subsided, and the patient arose from her bed eight days after onset, but even then complained of soreness in the right lower abdomen, and walked bent forwards. Patient was about for four days, during which time she suffered an attack of pain and vomiting. The night before admission she complained of increased abdominal pain and frequent emesis. The next day brought ease and much comfort, when the bowels moved at 3 o'clock in the afternoon. On admission at 8 P.M. the temperature was 103° F., and the pulse 126 per minute.

Examination revealed slight abdominal distention with bilateral mural rigidity and marked tenderness below the umbilicus. There were points of greater tenderness in both iliac fossæ, these points spanning an area in which two tumors were distinctly felt.

After celiotomy the tumor was so juxtaposed that at first sight it resembled a distended cæcum over an abscess or a cyst of ovary. Further manipulation however revealed the condition reproduced in Fig. 1. The first cyst seen encroached upon the

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ileum, and increased the non-peritoneal area of the latter by pushing apart the lamellæ of the mesentery at its intestinal border. This cyst had a diameter of 5 cm. and was situated about 15 cm. proximal to the ileocæcal valve. Close by it, resting on the right aspect of the gut and partly on the anterior lamella of the mesentery, was a second cyst of the same dimension; and adjoining this latter cyst on the right, between it and the first, was a smaller cyst, the size of a bean. A loop of ileum was so related to these two cysts that it was distal to the first and dorsal to the second. A third large cyst was found on the left lateral aspect of the coil of ileum, nearly opposite to the second, but lying more deeply in the right iliac fossa. As the sketch shows, the loop of the ileum was partly throttled by the grasp of the three cysts, and was free only opposite its mesenteric attachment.

As seen by the figure, the cysts and involved loop (25 cm.) of ileum were removed *in toto*, and lateral anastomosis performed. A glass tube in the pelvis sufficed for drainage. The patient was soon on the highroad to recovery and left the hospital June 13, 1908.

Here then was a patient suffering from incomplete intestinal obstruction the cause of which is plainly evident. The abdominal pain was doubtless due to the spasmodic contractions of the laboring intestine. Posture seemingly determined the obstruction, for when the patient was up and about, the latter appeared, but was relieved by recumbency. The mechanical action at play here may be worked out by reference to the sketch.

A case that nearly parallels the above was in the Leeds Infirmary, under Mr. Jessop (cited by Moynihan: *The Medical Chronicle*, September, 1902):

M. J., aged 6 years, female; admitted June 9, 1892. For three months the child had complained of occasional attacks of sickness and vomiting, with pain across the front of the abdomen; there were two such attacks; and altogether there have been about one dozen. Their frequency has latterly been increasing. . . . A single attack may last a few hours or a few days.

On examining the abdomen there is a trilobed tumor situated almost in the midline. The swelling is dull, but on two occasions a resonant band has been distinguished running across the middle. The area sur-

rounding the tumor is everywhere resonant. The tumor is usually movable in all directions, and can be rotated freely round its central point.

Under ether the tumor was removed. It was found to be a mesenteric cyst and multilobular, each loculus containing clear fluid. The mesentery and intestine were removed and the cut ends of the bowel united by Paul's tubes. The patient made a good recovery.

The cysts above described are the multilocular types of serous cysts, the other type being the simple. But what strange factor determines the presence of such cysts in such an unusual locality? Braquehays (*Archiv gén. de Méd.*, Paris, September and November, 1892; also *Revue de Chir.*, 1892) classified mesenteric cysts under five headings, and Moynihan (*loc. cit.*) under eight; but Dowd (*ANNALS OF SURGERY*, 1900, vol. xxxii, p. 515) furnishes the following simple, but scientific, classification: (1) Embryonic cysts, (2) hydatid cysts, (3) cystic malignant disease.

My case fits in the first category, namely, that of embryonic cysts. Moynihan (*loc. cit.*) says: "One may remark with some assurance on the great probability of embryonic origin of most of the cysts found in the mesentery being established. The more closely cysts of the mesentery are studied the more likely does it become that, with the exception of parasitic and malignant cysts, all the forms are embryonic in origin, and are due to "rests" derived from the Müllerian or Wolffian organs or ducts, or from the ovary." Dowd (*loc. cit.*), by reviewing the anatomy of the primitive genito-urinary organs and alimentary canal, shows how easily a sequestration from the Wolffian body, or the embryonic genital gland, could be included between the folds of the mesentery, and proceeds with the statement: "It is altogether within the bonds of probability that such a separation should from time to time take place from the Wolffian body or the germinal epithelium at an early time in embryonic life; and, if such portions are separated, it is not strange that they should be carried into the mesentery, mesocolon, or mesorectum in the course of their development, and there form cysts such as this one or like many of the others which have been described."

FIG. 1.



Cysts of the mesentery.

The first mesenteric cyst was reported as an anatomical curiosity by Benivieni, a Florentine anatomist of the sixteenth century. No more significance was attributed to these cysts from that time until the middle of the past century. From 1850 to 1880, mesenteric cysts were occasionally found at operation when the expected lesion was ovarian cyst. It is only within the past thirty years that systematic clinical studies of these cysts have been made. One of the most meritorious and widely quoted of these studies was that contributed by Dowd (*loc. cit.*) in 1900. The author reported a case of dermoid cyst between the layers of the transverse mesocolon, emphasized the morphological significance of these tumors, offered a new classification, and showed the importance of histological examination of the cyst wall and analysis of its contents. Unfortunately this last could not be done in my case, because the specimen was lost after it was sketched.

The next important contribution was made in 1902 by Moynihan in a paper entitled "Tumors of the Mesentery" (*Mesenteric Chronicle*, Sept., 1902). Moynihan classifies cystic disease of the mesentery under eight headings, and describes examples of each. After a brief *résumé* of the subject from the clinical standpoint, he concludes with a short account of solid tumors of the mesentery. Speaking of chylous cysts, Moynihan says: "These are the most common form of mesenteric cysts, and may arise in two ways: either they are primarily dilated and varicose lymphatic vessels, which, gradually enlarging, form cysts; or they are *primarily serous cysts*, the lacteals bursting into the cyst on account of stretching and thinning of their coats. *The latter mode of origin is, in all probability, the more common.*"

In 1906 appeared a paper by Ayer entitled, "Enteric and Mesenteric Cysts with Report of an Unusual Case" (*Am. Jour. Sc.*, Jan., 1906). The cyst in question was situated at the angle formed by the mesentery of the ileum and the reflection of the peritoneum at the descending colon. It was the size and shape of a duck's egg, and occupied the lumen of the cæcum. The cyst contained about four ounces of clear, viscid

fluid. Ayer's cyst was apparently similar in structure and origin to mine, falling, therefore under the heading of serous cysts. Speaking of the origin of the cyst, Ayer says: "Let us suppose that the cyst in question has its origin in the Wolffian body, the Wolffian duct, or Müller's duct. Recognizing the tendency of these 'rests' to undergo cystic degeneration and postulating the existence of such a process in the present instance, it is not difficult to conceive the chain of events, beginning with a tiny retroperitoneal 'rest' *in situ* and ending with the same structure which has undergone cystic degeneration, has become many times enlarged, and has migrated between the layers of the mesentery during the development of that structure as far as its attachment to the gut, there pushing before it the structure forming the wall of the intestine, and eventually lying, to all intents and purposes, within its lumen, though, anatomically speaking, outside it." Ayer represents schematically, by five figures, the probable course and final resting place of the cyst. Ayer's patient, like mine, suffered from chronic intestinal obstruction; his cyst, however, encroached more directly upon the lumen of the bowel than mine, since, situated at the cæcum, it had not the same breadth of mesentery in which to develop as had mine, located farther up on the ileum. To Dowd's aforementioned classification into (1) embryonic cysts, (2) hydatid cysts, (3) cystic malignant disease, Ayer adds (4) cysts arising from the glandular structures of the intestinal wall, and (5) cysts of the normally placed retroperitoneal organs. These two minor amplifications were suggested by reports of recent cases.

In 1907 F. Niosi, assistant in Professor Ceci's Clinic at Pisa, wrote an exhaustive monograph entitled: "Mesenteric Cysts of Embryonal Origin, etc.", which was translated and published in *Virchow's Archives* (cxc, No. 2, pp. 217-338). Niosi's cyst lay in the mesocolon, between the anterior leaf of the transverse mesocolon and that of the descending colon. After a most thorough and exhaustive histological examination of the cyst wall and chemical examination of its contents, Niosi attributed its genesis to the Wolffian body upon two

grounds: (1) From the structure of the wall, which was lined by cylindrical epithelium, and contained tubules formed of cylindrocubical cells; (2) from the presence of nodules of suprarenal tissue. Niosi believes there is a similarity between the structure of his cyst and the mesonephron cysts of the broad ligament, and that from this similarity further convincing arguments arise for the origin of the latter cyst from the Wolffian body.

Niosi's classification is: (1) Cysts of intestinal origin proceeding from the concave side of Meckel's diverticulum, which insinuate themselves between the two layers of the mesentery; or cysts from rests which spring from the intestinal wall, and during development have been enclosed in the mesentery. (2) Dermoid cysts. (3) Cysts which spring from retroperitoneal organs, as from the urogenital organs (germinal epithelium, ovary, Wolffian body, Müllerian duct). He collected 44 cases of embryonal mesenteric cysts, which fell into his classification as follows:

1. Cysts of intestinal origin.....	16
Doubtful cases of cysts of intestinal origin.....	7
2. Mesenteric dermoid cysts.....	14
3. Cysts derived from sequestered anlage of the urogenital tract	5
4. Cases which do not belong in any of the three categories mentioned	2
Total.....	44

By taking the total number of mesenteric cysts other than embryonal (184, of which Braquehays in 1892 collected 104; Becker from 1892 to 1900 collected 40; and from 1900 to 1907 there were 40 more) and dividing all mesenteric cysts into five varieties (chylous, lymphatic, bloody, hydatid, and embryonal), with the 42 cases of embryonal cysts collected by Niosi, it follows that this last variety is not, as formerly thought, so exceptional, but rather occurs almost as often as the other varieties.

Etiology.—As to the causation of embryonal mesenteric

cysts, Niosi states that heredity plays no part in their development.

Sex.—Given in 39 of the 44 cases: 24 females and 15 males.

Age.—Given in 43, as follows: foetus, 1; new-born, 1; under one year, 3; from one to ten years, 5; ten to twenty, 14; twenty to forty, 11; forty to fifty, 5; over fifty, 3. Moynihan cites three cases in which the ages were 73, 77, and 80 years.

Pathological Anatomy.—The cysts are usually round or spherical, but may be oval, pyriform, or club-shaped. In those that were pyriform or club-shaped there was a pedicle, which in the first case sprang from the vertebral column, and in the other inserted into the wall of the intestine. The size varies greatly, as from the wholly insignificant enterocystoma of Hueter, which was scarcely the size of a split pea, up to mine, which was as large as a man's head, or even the colossal cyst of Fehleisen, which contained 8.2 litres of fluid, and the cystoma of Nager, which was adherent to all the abdominal viscera. Moynihan cites Portal's case, which ended fatally by mere physical bulk of the cyst. The cyst wall varies in thickness from an almost transparent membrane to 1 cm., as in Niosi's case. Upon the surface at times run large vessels. In Dowd's case, a vessel the size of the femoral vein was present. Adhesions, particularly in large cysts, not infrequently involve the abdominal viscera (intestine, liver, spleen, pancreas, and bladder).

Intestinal disturbances caused by the cysts are often of more moment than adhesions. Sprengel notices invagination of the cæcum into the colon from a cyst scarcely 3 cm. in size. Eppinger observed volvulus; Bogers, volvulus with subsequent peritonitis; Fawcett, kinking; and Buchwald and Hediger, intestinal obstruction. Intestinal disturbances are severer the more intimately adherent cysts are to the intestines.

The position of a cyst in the mesentery is usually in relation with the terminal part of the ileum, at a varying distance from the ileocaecal valve. Less frequently, cysts are found in relation with the mesentery of the jejunum, cæcum, and mesocolon.

The contents of the cysts vary in color, consistency, specific gravity, and chemical constitution.

Symptomatology.—There are no definite symptoms peculiar to mesenteric cysts, as they do not cause pain nor any other subjective troubles; and they do not even engage the attention of their bearer until they have attained a certain size, or have caused acute intestinal obstruction. Moynihan emphasizes one symptom, namely, that of extremely rapid and serious wasting, probably due to interference with the lacteals.

Other symptoms described are a sensation of weight, nausea and vomiting, and constipation from pressure of the cyst upon the gut. So, too, colicky pains frequently arise from pressure upon the nerves, or from hindrance to the escape of fæces or of gas, or from adhesions. Such symptoms characteristic of no abdominal lesion, and common to many, are frequently attributed to "dyspepsia" or "indigestion," both by physician and by patient. This is but one of many maladies in which careful examination of the abdomen would, in all probability, clinch the diagnosis. On the other hand the omission of such a precaution may expose the patient to intestinal obstruction, which would lead to a sure, but by no means desirable, method of diagnosis.

Physical Signs.—Inspection is of value only for large cysts, in which case the tumor is usually most prominent near the navel.

Moynihan states that the most obvious and the most characteristic sign of the tumor is the mobility, transverse excursion being greater than vertical. This mobility is limited, if not entirely prevented, by adhesions. According to Niosi, the consistency is very elastic and fluctuation indistinct when the cyst wall is very thick, consists of several compartments (multilocular), or if the contents are inspissated, as in dermoid cysts. Confusion might arise between such fluctuation and the elasticity of a lipoma in the omentum or mesentery.

Percussion reveals an area of tympany around the tumor, and thus its independence of regional organs. If dullness should extend to the os pubis, by placing the patient in the

Trendelenburg position, the tumor, if a non-adherent mesenteric cyst, would gravitate towards the diaphragm, thus completing the ring of resonance. It is stated that, when the gut is empty, light percussion determines a band of tympany across the tumor, since the gut is interposed between the abdominal paries and the tumor.

Moynihan summarizes the most characteristic signs of a cyst thus:

1. Prominence of the fluctuating tumor towards the umbilicus.
2. Great mobility, especially in the transverse direction, and the possibility of rotation round a central axis.
3. The presence of a zone of resonance around and a belt of resonance across the cyst.

I believe that exploratory puncture is wholly unjustifiable here.

Differential Diagnosis.—Mesenteric are not commonly mistaken for ovarian cysts. In avoiding this error, it is helpful to ascertain if the tumor has grown from the abdomen towards the pelvis or *vice versa*; if an inferior zone of resonance can be obtained by the Trendelenburg position; and if both ovaries are independent of the tumor. Furthermore, there must be excluded hydronephrosis, omental, pancreatic, and renal cysts, cysts of the urachus, and lipoma of the mesentery. It is probable that, as in the past, most of these cysts will be diagnosed first on the operating table. Gas cysts of the intestine, of which Finney recently (*Jour. Am. Med. Assoc.*, Oct. 17, 1908, vol. li, pp. 1291-1297) collected 19 cases, might at first sight cause confusion at operation; but these, it seems, occur in clusters of very small cysts, which explode on pressure.

Prognosis.—The prognosis of mesenteric cysts conforms with that of abdominal lesions of similar magnitude. Uncomplicated cases, operated upon with good judgment, should recover, especially since infection is not concerned in the etiology of such tumors. In adhesions and intestinal obstruction, however, lurk dangers commensurate with the extent of the one and the duration of the other.

Treatment.—As soon as discovered, an intramesenteric cyst should be removed even in the absence of symptoms, and this, if for no other reason, as prophylactic against intestinal obstruction. It is known that chyle cysts frequently cause emaciation, and it is conceivable that operative delay here might dangerously impair the operative stamina of the patient. It is not absurd to refer to malignant degeneration in these cysts. Now and then a branchial cyst becomes malignant, so why not an intramesenteric? One well-known theory concerning the origin of malignant tumors puts the onus on misplaced embryonal tissue, and surely the tissue of some of these cysts is misplaced embryonal tissue. We shall watch further case reports for such a mishap.

There are four ways of dealing with intramesenteric cysts: (1) By aspiration; (2) by cystostomy and drainage, with or without the use of caustics; (3) by enucleation; (4) by resection of the involved intestinal segment. The first method (aspiration) was followed by recurrence in over fifty per cent. of cases, and is now obsolete. The second method (cystostomy and drainage), first employed by Sir Spencer Wells, is useful in the presence of numerous adhesions, to dissever which might impair the nutrition of the intestinal wall, or in an emergency. The third method (enucleation) is considered by many ideal, and is ideal when practicable. The fourth method (resection) I recommend in multiple, juxtaposed cysts, when it is deemed that too much surgical interference, as from dealing with the cysts one by one, carries more risk than simple resection.