

**THE SOUTHERN PRACTITIONER: AN
INDEPENDENT MONTHLY JOURNAL,
DEVOTED TO MEDICINE AND
SURGERY; VOL. XXX; NASHVILLE,
APRIL, 1908; NO. 4; PP. 157-203**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649266401

The Southern Practitioner: an independent monthly journal, devoted to Medicine and Surgery;
Vol. XXX; Nashville, April, 1908; No. 4; pp. 157-203 by Deering J. Roberts

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DEERING J. ROBERTS

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DEVOTED TO MEDICINE AND SURGERY

SUBSCRIPTION PRICE, ONE DOLLAR PER YEAR

DEERING J. ROBERTS, M.D. EDITOR AND PROPRIETOR

VOL. XXX

NASHVILLE, APRIL, 1908

NO. 4

Original Communications.

ACUTE OBSTRUCTION OF THE BOWEL, DUE TO MECHANICAL CAUSES.

BY M. C. M'GANNON, M.D., NASHVILLE, TENN.

This is a subject of paramount importance to both the physician and surgeon, upon which neither can afford to err, either in diagnosis or treatment, because mistakes in either mean death to the patient. The further fact that the disease is, in the great majority of instances, amenable to successful treatment, places it in the list of those that should be familiar to all practitioners of the healing art.

By intestinal obstruction, we mean that condition of the bowels by which its contents are prevented from onward passage, because of a closure of the lumen of the gut.

The causes producing this condition of occlusion of the lumen

of the bowel and obstruction of the onward flow of its contents are either (1st) within the gut, or (2d) external to it.

The most usual causes operating within the intestine are:

(1) *Inspissated fecal matter, or fecal impaction.* The collection of hardened fecal matter collects in the large intestine and seldom causes a complete blocking of that viscus.

(2) *Fecal stones.* Of these there are several varieties:

(a) *Coproliths*, which develop in the large intestine from inspissated fecal matter. They may attain a large size and great firmness and completely occlude the lumen of the bowel. It is rare, however, that complete obstruction is produced by these masses, since there is usually sufficient space between them and the wall of the gut to permit of the passage of liquid feces and of gas.

(b) *Enteroliths.* These are smaller stones that arise in the intestines. They vary much in weight and consistency, depending upon the material entering into their formation. The harder ones are made up of phosphates of calcium or magnesium, deposited about some foreign body which serves as a nucleus. The lighter and softer enteroliths are made up of vegetable indigestible material and having incorporated with it salts of lime, magnesium or sodium.

(3d) *Gall stones.* These gain an entrance to the intestine usually by a fistulous opening between the gall-bladder and the duodenum; though cases have not been wanting in which the stone has ulcerated its way into the duodenum from the common bile-duct. The stone having reached the intestine, may cause obstruction at any point between that of entrance and the ileo-cecal valve. It is however, much more common to have the lumen of the gut closed where it is smallest and where the intestinal mesentery is shortest, viz., in the lower part of the ilium.

(4th) *Absolute obstruction by parasites.* Authorities are not agreed as to whether complete obstruction ever arises from this cause. The writer has no personal knowledge of an authentic case of absolute obstruction due to this cause.

(5th) *Tumors.* Neoplasms growing within the intestinal canal may fill it and prevent the passage of both gas and feces.

Of the causes acting on the outside of the intestine to narrow its calibre and cause complete obstruction, we may preferably consider:

(1st) *Volvulus*. By this we mean a twisting of coils of intestine upon each other, or a torsion of a single coil upon itself, so that the lumen of the intestine is closed. The closure is not necessarily always complete. It occurs most commonly at the sigmoid flexure of the colon; rarely at the ileo-cecal junction or other parts of the large intestine. It occurs, though not frequently, in the small intestines. The actual twist is, as a rule, about the mesentery as an axis; but it is quite possible and cases are reported in proof of it, for the gut to twist upon itself. Coils of small intestines may become knotted together, or the ilium may become tied up with the sigmoid flexure of the colon. The twisting may vary in degree. When the volvulus is not complete, spontaneous recovery may take place; but when the torsion is complete the changes that speedily follow in the parts involved make untwisting impossible.

The etiological factors entering into the cause of volvulus are numerous.

Fecal impaction stands first upon the list. The waste material fills the fecal reservoir, the upper part of the filled portion causes it to prolapse upon the lower part, thus bringing the two ends near together, when peristaltic movements twist them upon each other. Of other causes for volvulus, the most active are undue intestinal peristalsis; a long mesentery; contracting exudate in the mesentery; tumors and bulky, undigestible food stuffs.

The changes that follow a complete closure of a portion of the intestines by a twisting about the mesenteric axis is congestion due to interference with the venous return, œdematous thickening of all of the bowel coats, decomposition of the intestinal contents with formation of gas, and then necrosis of the strangulated part.

At first there is violent peristalsis without much abdominal distension, but this is soon followed by paralysis of the intestinal wall and gaseous distension of the abdomen and a collection into the peritoneal cavity of a quantity of bloody fluid.

(2d) *Intussusception or Invagination*. This term is used to express a condition in which one part or portion of intestine is rolled

into the lumen of the adjacent portion—that is, the one part is swallowed by the other. The intussusceptum, or entering part, forms two layers, the entering and returning layers; while the intussusciens or receiving part, forms a third layer. So that in every case of complete invagination there are in the mass or tumor, at least three distinct intestinal layers, and also the mesentery of the invaginated part. There may, however, be more than three coats. In what is known as the double form, five coats may enter into the mass and in the triple form, seven are found. Partial invagination arises when a part of the intestinal wall is dragged into the adjoining portion of the gut. This is usually due to the existence of a tumor attached by a pedicle to the wall, and hanging within the intestinal lumen.

Intussusception may occur in any portion of the intestines small or large; but it is more frequent in some parts than in others.

Invagination of the small into the large intestine, forms more than fifty per cent of all cases for all ages. Though in childhood, the percentage is much higher.

About thirty per cent of cases in childhood occur in the ilium and twenty per cent in the colon; while these two situations furnish about an equal number in adult life.

The disease may almost be said to be one of childhood, since at least half of all cases occur during the first few years of life.

The actual cause producing intussusception of the bowel is as yet not positively determined, though certain etiological factors have been recognized and tabulated.

Some of these are: *Age*—fifty per cent occurring in youth; *sex*—the majority of cases occur in females; *Foreign growth* in the intestine; *abdominal injuries*; *pregnancy*; *diarrhoea*, and other intestinal disorders.

Three theories of the actual cause of this trouble may be mentioned; all have ardent and enthusiastic advocates.

First—*The Spastic Theory*. According to this theory, it is contended that a portion of the intestine undergoes tetanic contraction, and then the adjacent relaxed portion is drawn over it.

Second—*The Paralytic Theory*. This is just the reverse of the spastic contention. According to it there is no undue contraction,

but a portion of intestine relaxes, because of the paralysis due to diarrhoea, traumatism, etc., and the adjacent normally contracting portion slips into it.

Third—*Disproportion in the width of the sium and the cecum.* This is stated to be responsible for many, if not all of the cases of ileo-cecal invaginations.

PATHOLOGICAL CHANGES FOLLOWING INTUSSUSCEPTION.

A well defined line between the *Agonal* and the *Vital* forms of intussusception should be drawn. The former is physiological and occurs just before death; the latter is pathological and has no causative relationship in time with dissolution.

The physiological variety occurs in the small intestine, is usually multiple, and the invagination may be either from below, upwards, or from above, downwards, and does not drag the mesentery in with it.

The pathological variety differs in being usually single, occurs at any age; the invagination is descending in ninety per cent of the cases, and the mesentery accompanies the invaginated part.

The pathological variety is the only one that concerns us as practitioners; but from a medico-legal standpoint we must not forget the characteristics of the other.

In pathological intussusception the invagination in nearly all cases is from above downwards, and the mesentery is carried in with the intussusception; the venous return is interfered with in the invaginated portion, congestion, edema, inflammatory exudate and necrosis, soon supervene.

At first there may be some relief to the congestion from the rupture of the blood vessels in the mucous membrane of the congested portion, but as the swelling increases, the relief ceases and the intussusceptum dies. A local peritonitis unites the peritoneum at the neck of the invaginated portion, and if the patient lives long enough for the intussusceptum to slough away, the general peritoneal cavity will be thereby protected, and the patient may recover.

OBSTRUCTION BY BANDS AND HERNIAL CONSTRICTIONS.

(a)—Bands result from peritoneal adhesions caused by peritonitis. They may be formed in any part of the abdominal cav-

ity, but occur most frequently at the ileo-cecal junction, in the region of the gall-bladder and at the sigmoid flexure of the colon.

The small intestine is the part usually involved and the infection which causes the inflammatory band may arise from the appendix vermiformis, the female pelvic organs, the gall-bladder, or a Meckel's diverticulum.

The bands may not only surround the intestines, but they may form clefts or openings into which a coil of intestine may find its way and become obstructed.

(b)—Clefts or openings in the mesentery or the omentum through which a loop of intestine may find its way and have the lumen obstructed, may exist congenitally or be the result of careless handling at a time of operation.

(c)—Hernias, both internal and external, are causes for bowel obstruction. When it is produced by an external hernia, it is not, as a rule, difficult to diagnose; but when an internal hernia is responsible for the closure of the bowel lumen its recognition may be, and oftentimes is, impossible.

(d)—Obstruction of the bowel sometimes results from the pedicle of an ovarian tumor becoming twisted about a coil of intestine. Recently, the author operated upon a case of obstruction in which the tumor pedicle was wrapped about the sigmoid flexure of the colon, causing complete strangulation of that portion of the intestine.

The symptoms of acute obstruction are: Pain, nausea, vomiting, constipation, meteorism, ascites, shock and collapse.

Pain.—In a typical case the pain is sudden in onset; is colicky in character, and is referred to the umbilicus. As a rule it is violent and persists—wave after wave in increasing intensity being dashed against the obstruction in an effort on the part of nature to overcome it. After a time, and especially if the intestine be somewhat emptied by vomiting, the pain may cease, only to again return in a short time, after the intestine has either regained its tone or been filled with feculent material. Tenderness over the abdomen is not present until a peritonitis or an inflammation of the intestine has occurred. A mild degree of pressure tenderness may arise late in the disease and be due to

the frequent and violent contractions of the intestinal muscle fibers.

Vomiting.—This occurs sooner or later in all cases. At first the vomiting may be reflex, but later it is due to the intestinal contents being forced into the stomach by the violence of the peristaltic waves. The contraction of the intestinal coats narrows the lumen of the gut; the bowel contents being unable to pass the obstruction, must find an outlet somewhere, and, as a consequence, they are forced back into the stomach from which they are vomited. The vomited matter is at first, the stomach contents; this is followed by bile stained mucous and later the ejected matter is a brownish fluid, with a fetid or fecal odor. This is the so-called stercoraceous vomiting. The vomiting of scybalous masses has been reported. It is difficult to understand how this could occur through a normally formed intestinal tract. The vomiting occurs earlier and is more persistent when the obstruction is in the small bowel. When the obstruction is in the colon and especially if it is situated in the sigmoid or rectum, the vomiting may be delayed and will not be persistent. After the first emptying of the stomach, the vomiting may cease for a time, only, however, to recur.

Constipation.—Neither feces or gas pass from the bowel in complete obstruction. An enema may wash from the intestine below the point of obstruction, some fecal masses, but no flatus will escape with the ejected fluid and fecal matter.

Meteorism is always present, to some degree, in obstruction of the bowel. It is progressively increased as the obstruction nears the lower part of the intestinal canal; being but slight when the disease is situated high up in the small intestine, and greatest when the sigmoid is the seat of the obstruction. This symptom is by no means diagnostic, and should not be waited for in order to confirm the diagnosis. It exists only in a slight degree at any time, when the obstruction is in the duodenum or jejunum. As a symptom it occurs rather late in the disease and only after some paresis of the bowel muscle has arisen. In neglected cases of low obstruction, the intestinal distension may be extreme.

A form of tympanites known as Local Tympanites is described and should be sought for in every case in which the