

A NEW TEST FOR THE DIFFERENTIAL DIAGNOSIS OF APPENDICITIS.*

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I am not unmindful of the assurance I display in announcing a new test for the differential diagnosis of appendicitis. The test is but a more rational method of applying abdominal palpation, resulting from a better understanding of the cause of the pain produced in an inflamed appendix by abdominal compression. I have found the procedure so simple and satisfactory that I hope it may prove so to others. I have applied to it the term "cecal distension test" as expressive of the procedure.

DESCRIPTION OF THE TEST.

The patient is best placed on a hard, low bed or table. The knees should be flexed and two pillows placed under the head and shoulders, giving a dorsal semirecumbent position, rendering the abdomen flaccid for the most satisfactory abdominal compression. The surgeon stands on the patient's left, facing the feet. The palmar surfaces of the fingers of the right hand are placed under the patient's left inguinal region and the fingers of the left hand used to reinforce the right. Deep pressure is then made backward, slowly drawing the fingers deeply and forcibly upward under the left costal arch. This procedure is intended to compress the lower portion of the descending colon and force its gaseous content into the transverse, and thence to the ascending colon. The pressure being maintained with the fingers of the left hand, the right hand is then removed and placed over the upper portion of the descending colon, or better over the transverse colon, and the fingers are quickly and forcibly depressed. A gaseous compression wave will travel across the transverse and down the ascending colon and on arriving at the cecum will produce cecal distension, yielding a typical sharp pain in the right iliac fossa, if inflammation of the cecum or appendix be present.

PRINCIPLES OF THE TEST.

The diagnosis of pathologic conditions in the abdomen is peculiarly difficult because of the impossibility of direct palpation or examination of individual organs. If traction at will could be made on an inflamed tube, gall bladder or appendix, an exact diagnosis could be better made. Whenever any inflammation exists about the cecum an abnormal amount of gas collects in the colon. This is not usually transferred to the small intestine, owing to the sufficiency of the ileocecal valve. The compression of this colonic gas and the descent of a gaseous compression wave into the cecum produces a sudden motion of the inflamed area, exactly as though a cord were attached.

There may be some differences of opinion as to the exact cause of the pain. After much study, with operative and postmortem examination, I have reached the following conclusions: Distension of the bowels or appendix does not cause pain. Pain is rather relieved, as the visceral distension from toxemia increases during the course of intestinal diseases. Neither is pain relieved by rupture of the appendix, which would often render distension of that organ impossible. As distension increases, both pain and muscular action decrease. For this reason, the pain of an inflamed appendix seems

inseparably connected with motion or muscular action. Dull aching or throbbing pain in appendicitis may be caused by swelling and peritoneal tension. The typical cramp-like pains of appendicitis are probably due either: (1) to tetanic contractions of the muscular walls of the ileum or appendix, compressing the nerves, like a cramp in the leg, or (2) to peristaltic or other visceral motions, pulling on sensitive adhesions. In case of the test, the increased intracecal tension might induce counterperistalsis in the ileum, which would be transferred to the appendix; or peristalsis might be induced in the appendix by sudden cecal distension independent of peristalsis in the ileum, or distension movement might pull on sensitive appendicular adhesions—we know that an adherent inflamed appendix is much more painful than a free one. In any case the pain is due to distension motion or to induced peristalsis. Pain by direct compression at McBurney's point is probably produced by similar colonic motion, or peristalsis, rather than from actual palpation of the appendix.

APPLICABILITY OF THE TEST.

The cecal distension test, if carefully carried out, will demonstrate conclusively, I believe, the presence or absence of active inflammation in the cecum or appendix by the typical colicky pains usually following in the right iliac region. If the pain during the attack has been reflected to the pelvis, gall bladder, epigastric or umbilical region, the induced pain is also likely to radiate there.

Diseased conditions of the small intestines, stomach, gall bladder, kidney, ureter, bladder, ovary, tube, etc., may simulate typhilitis and appendicitis, causing tenderness and pain at McBurney's point, but in my experience they do not respond to this distension test, unless secondary inflammation has invaded the walls of the cecum or appendix. This test is of particular value when rigidity and tenderness on the right side make a direct palpation painful or impossible.

Whether the upper portion of the descending colon or the transverse colon be used for the production of the compression wave will depend on circumstances. Fortunately in the diseases under consideration the stomach is usually empty and the transverse colon is readily located by percussion. When the colon is loaded with fecal matter, or assumes the V form, hanging downward toward the symphysis, or the small intestines are much distended, or the abdominal wall abnormally fat, or the rigidity and tenderness have extended to the left side, the application of the test will have to be varied. Often the method will then consist merely of a vigorous massage of the left colonic region in an antiperistaltic direction. The procedure I have outlined, I find, gives the most satisfactory compression in the majority of cases. It is usually better to induce the compression wave at the transverse colon rather than under the left costal arch, as in this way more of the descending colon can first be compressed and one is surer of striking the transverse colon than the deeply situated splenic flexure.

HISTORY OF THE TEST.

Some three years ago I visited a woman on the second day after an operation for acute appendicitis. Her abdomen was slightly distended and she was complaining of pains, which, she said, were exactly like those suffered before the operation, and expressed some doubts as to her appendix having been removed. As soon as

* Read before the North Texas Medical Association, Fort Worth, Texas, December, 1907.

the rectal tube was passed she expelled a large amount of gas, and the pains never recurred. At this time I had under observation a young woman with a history of repeated attacks of pain and tenderness in the right iliac fossa. After her attacks a localized tenderness would remain for days, during which time it was almost impossible to move her bowels. She at one time took seven compound cathartic pills, followed by large doses of salts and oil, with little or no effect. Enemas proved likewise inefficient. On one occasion I resorted to abdominal massage. She was too tender to endure manipulation over the right half of the abdomen, and the best that could be done was a deep massage of the left half. It was during this treatment that I discovered that a certain manner of pressing on the left side induced a typical sharp pain in the right iliac region. I concluded that this procedure produced cecal distension similar to the condition existing when postoperative gas pains occur.

Since that time I have been accustomed to mention to my students in lectures on the cecum and appendix the effect of distension and motion of these organs when inflamed. In my practice I have applied the test to a large number of cases, but have been slow to appreciate the test as a distinct and reliable procedure.

The general principles of the test are not new. The pain often produced at McBurney's point by pressure over the region of the gall bladder has by some been believed to be due to compression of the colon. There are few surgeons who are not familiar with the sharp pain over an inflamed appendix often produced by making gradual deep pressure in any part of the abdomen and suddenly removing the hand. The pain is caused by sudden visceral readjustment on release of pressure. The cecal distension test is but an elaboration of these ideas, and there is probably no surgeon who has not at some time unconsciously used the test and elicited pain thereby.

Soon after my early observation I failed to get a response to the test in the case of a boy apparently suffering from appendicitis—a diagnosis made by another practitioner. The boy later fell into my hands with a right lumbar sinus and died two years later with tuberculous sacroiliac disease of the right sacroiliac articulation. Whenever I operated for appendicitis in the absence of this distension test, I have either failed to relieve the patients of their typical pains or found other conditions which explained their suffering. In one case was revealed a duodenal ulcer which simulated appendicitis in most differential points except the distension test. In another case a small intraligamentous cyst of the right broad ligament explained the absence of reaction to the test in what seemed an appendiceal affection. I have recently obtained a positive reaction in two fulminating cases of appendicitis, with early gangrenous perforation, which demonstrates that the pain produced by the test is not due to gaseous distension of the appendix.

DESCRIPTION BY A CONTEMPORARY OBSERVER.

I had partly written this paper, intending to present it at the next session of the American Medical Association, and had sent in another title for a paper to be read at this meeting of the North Texas Medical Association. On Nov. 5, 1907, I received my weekly number of the *Centralblatt für Chirurgie*, published October 26, in Breslau. In this number was a brief paper by Rovsing of Copenhagen, entitled "*Indirectes Hervor-*

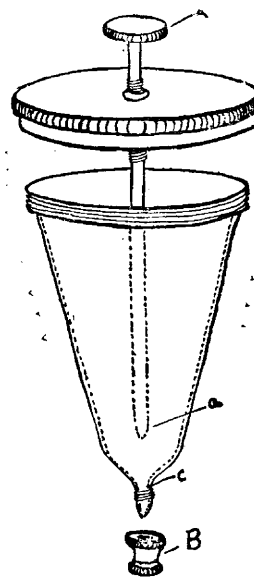
rufen des typischen Schmerzes an McBurney's Punkt" ("Indirect Production of Typical Pain at McBurney's Point"). I immediately wrote the secretary of this association and announced the title of this paper to insure the earliest presentation of my ideas. To speak of my work as original, after the publication of Rovsing's article,¹ would be embarrassing were there not so many men present who have known of my work and to whom I have for the past few years explained the principles of the test. Rovsing and I have been working on the same idea. He has had a better operative opportunity to observe the phenomena than have I. My conceptions of the principles underlying the test and the methods of applying it, however, seem to me more exact and practical.

NEW CHLOROFORM DROPPER.

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NEW ORLEANS.

The chloroform dropper here illustrated has given me much satisfaction. It is a metal container, non-leakable and unbreakable. It is always ready for use by simply turning the screw A slightly to the right. The flow of



chloroform or ether can be regulated in this manner so as to yield from two drops per minute to a steady flow, if so desired. The cap B prevents leakage when the bottle is being refilled. The needle valve fits into the opening c. The whole bottle can be used with one hand, leaving the other hand free. There is no danger of the stopper falling out and deluging the patient's face with a shower of chloroform or ether.

1. A translation of Rovsing's article was presented with this paper when read, but as a review has already appeared in *The Journal*, Nov. 30, 1907, p. 1882, it is not here reproduced.—Ed.

Surgery and Internal Medicine.—Moore, in *Colorado Medicine*, calls attention to the fact that the practice of surgery has become so attractive to graduates in medicine during the last two decades that their best energies are given to its study, with the results that in many cases internal medicine is neglected, and that medical colleges are graduating "specialists" instead of physicians in the true sense of the term. Many young men leave college, he declares, with the fixed idea that as surgeons they are fully equipped as internists. This idea, however, is generally eliminated by experience.