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ABDOMINAL PAIN

By J. H. MUSSER, M. D.
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With the limitations that must be placed on all subjective symptoms, pain is the one which more than all others leads to the recognition and localization of disease within the abdomen. Fortunate is the physician who has the aid of a patient with clear intelligence to describe the character, the mode of onset, the localization, the direction of transmission, the association with altered function, and the many qualities of this valuable clinical expression of disease. Unfortunately, too often, when the aid of the patient is needed the most, as in the toxic period of typhoid fever, it avails not as it should.

ASSOCIATE EXPRESSION OF PAIN

Spasm of muscles. The occurrence of *spasm* of muscles, related by nerve supply to the organic lesion which causes the pain, as indicated by *resistance,* is of great aid in the localization of the lesion. No more valuable indication of the occurrence of irritation or inflammation exists than this symptom. Of much significance under certain circumstances is its *absence*, for often it does not imply under such circumstances the absence of lesion. (*a*) It is wanting, of course, when there is no muscle, or perhaps very little, to undergo spasm. Hence in atrophied abdominal walls, as occur in women from overdistension, such spasm may not occur. In a case of perforating gastric ulcer with oncoming peritonitis, operated on by Keen, within six hours of perforation, no spasm or resistance was detected. Similar

cases of such character have occurred in cholecystitis, when often for similar reasons, mural atrophy, the muscle spasm is wanting. (*b*) It disappears with the onset of toxemia, and hence a rapidly lessening resistance with the slightest evidence of advancing toxemia, as indicated by the expression, the tongue, the pulse-rate, the mental condition, even though the temperature fails, is of grave significance. It may be found that the leukocytes do not increase, but may even fall to a moderate height, as 9,000 to 12,000 or even less, as we also find in grave pneumococcus infections, when a moderate leukopenia may be present.

Tenderness of Cutaneous Surface. Hyperalgesia. — Hilton, Head, Mackenzie, and others have repeatedly called attention to alterations of cutaneous sensibility in the distribution of spinal nerves related to affected organs within the body. Sherren[1] has called renewed attention to this cutaneous hyperalgesia, elicited by the head of a pin or some blunt instrument. That such hyperalgesia may exist is well known, but the point I wish to make is, if it exists and then disappears, as may also spasm and pain, the change is of ill omen unless all other symptoms subside. The absence of, or rather the disappearance of hyperalgesia means the occurrence of gangrene or perhaps perforation. The accompanying illustrations show the distribution of cutaneous hyperalgesia in appendicitis. They are taken from Sherren's article.

PAIN IN ABDOMEN DUE TO GENERAL CONDITIONS

The Intoxications. I shall pass over that due to lead-poisoning, only venturing to reinforce the warning of Janeway, and speak of abdominal pain due to uremia. The French authors have long since called attention to this symptom, and many years ago I made a verbal communication to the West Philadelphia Medical Society on it. I had seen it, as had likewise the French observers, in or preceding the uremic convulsions of puerperal nephritis. In the instances under my observation the pain was in the epigastrium and both hypochondria. Only recently I was asked to see a case of alleged severe indigestion with cramps in a woman who had been delivered four hours previously, and who had nephritis

in the latter part of her pregnancy. I warned them of the oncoming of uremic convulsions and coma, which unhappily was too true four hours later.

UREMIA SIMULATING PERFORATING GASTRIC ULCER

In my service of 1902, in the University Hospital, a patient was under my care for well-defined syphilis and nephritis. She had some epigastric pain, constant vomiting, and hematemesis. For reasons a gastric analysis was not made, but the vomitus did not give signs of any definite organic disease. On one occasion, while vomiting was temporarily arrested, sudden pain and shock ensued. The temperature fell to ninety-six degrees and the pulse rose. I was informed perforation had taken place. Professor Frazier saw her with me a few hours later. As the toxic features of uremia appeared to be increasing, operation was deferred. Temporary recovery from the uremia took place, but death followed within a month.

At the autopsy a marked chronic gastritis, with ecchymosis and abrasions of the mucous membrane, were found, but no ulceration of the stomach. The patient narrowly escaped operation.

The next patient was not so fortunate. I saw him on an afternoon, with well-defined uremia. He suffered very much from abdominal pain. He had an inguinal hernia. I sent him to the hospital, and asked that a surgeon see him to discuss with me the relation, if any, of the hernia to the pain and vomiting. We were prevented conjoint attendance upon the case, and the surgeon, thinking I had sent him in for operation, performed it without delay. Neither incarceration nor strangulation was found, and later the autopsy showed that pain could not be accounted for by any abdominal conditions. It was evidently toxic.

Hysteria and the Neuroses. I mention these states for the purpose of disclaiming against the accepted ideas of the frequency of abdominal pain of such origin. Too often we take refuge under the cloak of hysteria; too often such diagnosis is a confession that we are ignorant of the true cause of suffering. As

our experience increases I am sure we can "run down" these so-called neuroses. The more I learn of abdominal disease the less I see of hysteria. Not many years ago I saw a seemingly well-defined case of hysteria. The patient had great pain in the region of the liver and the right shoulder, and ill-defined symptoms of gallstones. Her mother had had gallstones. Because of the general symptoms, and especially the nervous symptoms, I gave it as my opinion that the pain was probably a neurosis, and advised against an operation. Later, gallstones were passed, and soon the patient was restored to health. The nonhysteric origin of pain formerly attributed to the neuroses is strongly supported by our increased knowledge of headaches. The ophthalmologist has hunted down many of the headaches formerly described as neurasthenic, and within a few years knowledge of the mysteries and vagaries of sinusitis, giving rise to various forms of headache and neuralgia, to which belongs the headache of early morning, continuing throughout the day, "disappearing as the sun goes down," has deprived hysteria of many accusations.

ABDOMINAL PAIN NOT DUE TO DISEASE BELOW THE DIAPHRAGM

Speaking to clinicians, it is not necessary to go further than to remind them seriatim of the many cases of abdominal pain due to extraabdominal causes. Thus we have pain due to:

1. Crises of locomotor ataxia and other organic spinal cord diseases.

2. Spondylitis rhizomalique. A case of this nature was brought to me, considered to be cancer of the liver or kidney. Many cases are referred to in the literature of the subject.

3. Caries of the vertebra.

4. Cancer of the vertebra.

5. Aneurysm of the thoracic aorta, especially located above the diaphragm.

6. Diaphragmatic pleurisy and rheumatism of the diaphragm.

A case that caused much interest was that of a robust man, who had been operated on for hemorrhoids. The man was evidently infected at the time of operation in the field of the operation. Fever and a mild leukocytosis were present. After a cold bath three days later the patient had a chill, severe pain in the

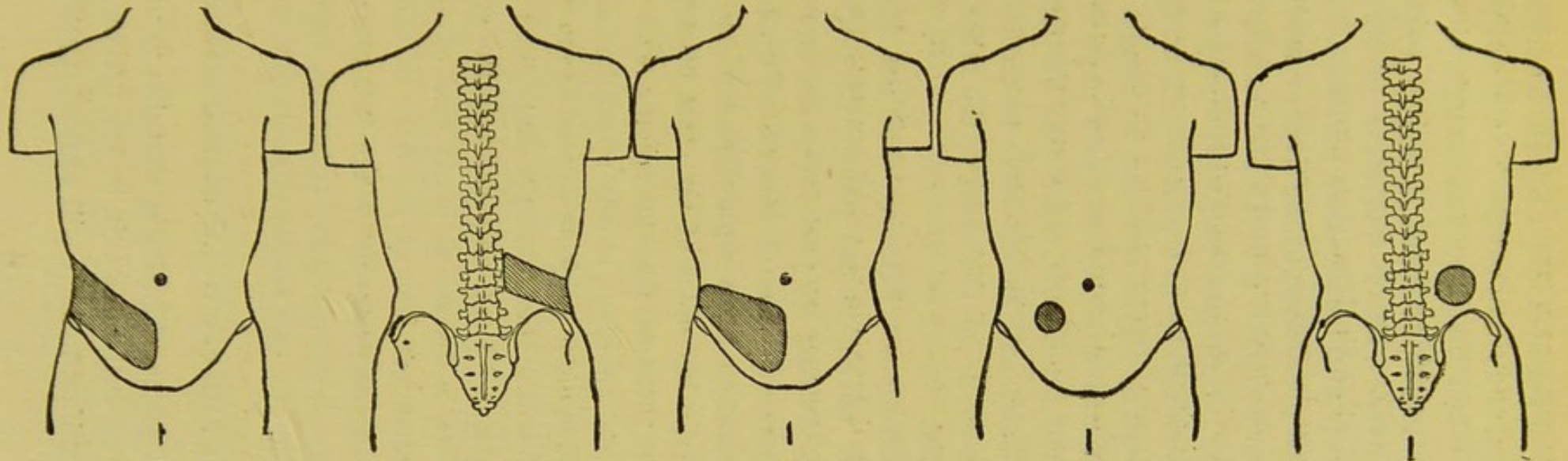

Fig. 1 Fig. 2 Fig. 3 Fig. 4 Fig. 5

Figs. 1 and 2.—Showing the area of cutaneous hyperalgesia in appendicitis corresponding to the eleventh dorsal area of head (Sherren). Fig. 3.—Showing the "appendix triangle" of cutaneous tenderness. Fig. 4.—Showing the small circular area of cutaneous tenderness occasionally present. Fig. 5.—Showing the rounded patch of cutaneous tenderness in lumbar region.

lower thoracic and upper abdominal region, tenderness along the diaphragm, dyspnea, and slight cough. No signs of pleurisy could be brought out. When the liver was brought down by a full breath against the palpating hand it excited pain, which suggested a tender liver. There was some myalgia about the shoulders. The fever and leukocytosis persisted. Although the development of multiple abscess of the liver or subdiaphragmatic infection was suggested, the general picture was that of diaphragmatic pleurisy, or rheumatism, with myalgia in other situations, occurring incidentally in a person with an infected rectal wound. The difficulties of the case can be imagined when it is known the patient was a highly neurotic physician, who bore pain badly, and the attendants, were two brothers, who were maximally sympathetic and keenly alive to pathologic possibilities, the one a leader in ophthalmology, the other a great nose and throat specialist.

7. Pulmonary affections. Pleurisy need not further be considered as a cause of abdominal pain. Of pneumonia much more must be said. During the past five years, two or three cases occurred each winter, in which I was called upon to decide if the anticipated operation for a reputed abdominal affection was or was not required. My notes of six cases belong to children, and it is chiefly in them we find pneumonia with symptoms of some acute abdominal affection, chiefly appendicitis. I have seen cases of pneumonia in older subjects treated as some form of liver disease, because of pain in the right hypochondrium and jaundice.

8. Cardiac affections. I can only refer to the epigastric pain of acute pericarditis, a disease so often void of symptoms and signs; of a congested left lobe of the liver in acute failure of compensation; of angina pectoris. When it is remembered in all these conditions, as well as pulmonary affections, vomiting and also flatulency may occur, we can realize possible difficulties to many.

ABDOMINAL PAIN DUE TO (A) GASTRIC AFFECTIONS.

The pain due to forms of gastritis, that due to ulcer, and that to carcinoma are so well known it is not necessary for me to enter into their consideration. I will content myself with calling

renewed attention to the pain of pyloric spasm, due to hyperacidity or to gastric ulcer, and to the pain of the incontinence of retention in cases of mild or perhaps spasmodic pyloric stenosis; to the change in location of the pain due to gastric ptosis; and to the extreme rarity of gastralgia, apart from hyperchlorhydia or organic spinal disease. Alleged gastralgia is so frequently an aberrant form of hepatic or pancreatic colic, that these conditions must be definitely excluded before we rest content with the diagnosis of a functional disorder. I must take this opportunity to urge alertness on the part of the clinician to detect the earliest evidence of shock, for, as an attendant upon perforation, its significance must be realized if we want to diagnosticate the accident. Instead of "shock," in the true surgical sense, a chill, a syncopal attack, some faintness or a hurried pulse must be the only expression of a perforation.

Epigastric Hernia. It may be proper here to say a word regarding that infrequent condition, epigastric hernia. The occurrence of epigastric hernia gives rise to symptoms which may simulate gastric affections or diseases of the gallbladder and gall ducts. Careful inspection and palpation will disclose the presence of the small subcutaneous tumors characteristic of this lesion.

(B) HEPATIC PAIN

Only to be mentioned to remind you of the many excellent papers on this subject read by members of this organization, and that the pain of early primary affections should be heeded, for it is the operative relief of these affections that prevents the long series of secondary affections.[2]

(C) RENAL PAIN

This must be passed over with the memoranda that the recognition of renal calculi can be wonderfully aided by radiographs, and to call attention to a rare condition which simulated renal pain.

Phlebitis. The patient had had a movable kidney transfixed by operation. Obstinate pain followed and simulated in part renal pain, although neither clearly paroxysmal nor attended by

hematuria, as in renal calculus. The radiograph showed an apparent calculus in the ureter about the brim of the pelvis. Operation for its relief disclosed varicose veins in this situation with two or three phleboliths the size of peas in the veins coursing parallel with the ureter.

(D) PANCREATIC PAIN

Exhaustively discussed recently, time forbids my going further than to state my conviction that pancreatitis is a more frequent affection than we are wont to believe. We recognize the rarer fulminating cases that are usually fatal. Cases subacute, mild in character, and chronic cases are more common. Pain attends these affections. I fully believe, with the additional experience that comes to us, we can recognize this cause of pain.

The problem for solution in these cases of localized pain is to differentiate the various causes and to recognize if the pain is the expression of a mortal lesion, requiring immediate action to save life. For the former it requires a most careful arraignment and analysis of all the facts in the historic diagnosis, of great importance in qualifying the subjective and objective phenomena; an analysis of the symptoms, a careful elucidation of the objective phenomena and the physical signs, and an accurate estimation of laboratory findings. Alteration of function must be correlated with physical conditions. For the latter, not only must such observations be made, but alertness and unceasing vigil must be not only daily, but hourly employed, to estimate properly the degree of danger of nature's outcry, expressed in pain. With breadth of view, nicety of observation, and eternal vigilance, the true significance of abdominal pain can be appreciated, human suffering assuaged, and fortunately much oftener than formerly, life saved.

THE DISAPPEARANCE OF PAIN

The occurrence of relief to suffering must not lull us into false safety. Such disappearance may be of diagnostic importance. Apart from termination of the disease in its natural course, such subsidence may be due to the (*a*) onset of gangrene,

(*b*) to an oncoming toxemia (*c*) to both, (*d*) to perforation of a hollow viscus, as the stomach or gallbladder or appendix, or the rupture of an abscess. If pain disappears suddenly there must be gradual, but prompt amelioration of all general and local symptoms if the patient is safe.

Pain due to gangrene is seen in appendicitis, and one must be wary, if he is not to be deluded into a false hope by its subsidence. This is all the more liable, as spasm and cutaneous tenderness may subside simultaneously. To exclude gangrene the clinical course of the disease must be closely analyzed; we must observe if the pulse rate fall, the temperature fall, the expression improve, the tongue become moist, and the mind perfectly clear. Remember, as with gangrene, perforation usually occurs under manifestly the same symptoms. If pain subsides because of the toxemia, an incident in the course of gangrene, its subsidence is more gradual. We must, therefore, appreciate the very slightest suggestive indication in cardiac, respiratory, or cerebral action, in the temperature, the condition of the skin, and—not readily portrayed, but most important—the expression. I fear many a toxemia has crept on until the patient is within its fatal grasp because of the darkened sick-room.

As evidence of the toxemia, a leukocyte count is of great value. It is probably just as significant when it falls or remains stationary. You know in pneumonia we look upon a leukopenia with much dread, and so it is in abdominal inflammation; if the leukocytes fall or remain at 8,000 or 10,000 it is a more dangerous sign than if they rise, providing in the first instance there is no improvement locally or generally. Hence, a low white blood-cell count, without improvement in symptoms—and especially of the general symptoms due to toxemia—is very grave. I have seen practitioners relieved when with relief of pain any tumor which had been presented disappeared. It is obvious if such tumor does not rupture into the natural passages, its disappearance bodes great evil. Sometimes a tumor will disappear from one region and appear in another. I was asked to explain the occurrence of a tumor in the left iliac fossa shortly after its disappearance from the right. The original tumor, due to pus, was bound

down by adhesions, and so the confined pus took the route of least resistance into the pelvis, around the rectum, and up to the opposite side.

PAIN ABSENT IN CONDITIONS IN WHICH IT SHOULD BE FOUND

Pain is the earlier, more common, and, from its special characteristics, of greater value than the usual symptoms of obstruction when the closure is slow in progress. The *absence* of pain enables us to decide upon the nature of the lesion. Thus, in a patient of Dr. Riesman upon whom Dr. Keen operated for intussusception, the symptoms were favorable until five days after operation, when causeless vomiting, increasing in frequency, began; at first gastric fluid alone was vomited, followed in about four days by the vomiting of the intestinal contents. We gave the opinion that the vomiting was due to obstruction of the bowel of paralytic origin. I quote from Dr. Riesman's notes—which he has kindly placed at my disposal—the appearances found.

Notes of Mrs. V. B.—Operation to relieve intestinal paresis causing intestinal obstruction. An incision was made on the left side, outside the first incision. On opening the abdomen no fluid escaped, but the hugely distended small intestine at once bulged into the opening. It was drawn out, and its color was found to be bluish purple. The vessels were injected; and the caliber of the bowel, that of a man's forearm, or even larger. Peristalsis was not visible, and the intestine dropped upon the table as lifelessly as if it had been that of a corpse. The distention began at about the duodenum and extended far down the intestine, ending abruptly somewhere in the ileum. At the point at which the distention ended, the bowel was contracted to about the caliber of a finger. This contracted bowel was pale and empty. There were no adhesions, no signs of peritonitis, and no exudate. On opening the distended part of the bowel, enormous quantities of yellowish, fluid, fecal material escaped and ran down upon the floor in a stream. Not a peristaltic wave could be seen. Even after the bowel had been emptied, slapping and hot applications failed to evoke any peristalsis. The colon was of normal color, was somewhat contracted, and contained—especially in the ascending portion—putty-like fecal masses that could be moved with comparative ease by applying the finger externally. The transverse colon was prolapsed as far down as the left iliac region. The sigmoid was greatly elongated. Union had taken place between the upper part of the rectum and the abdominal wall, along the line of sutures.

The absence of pain therefore in cases in which the other symptoms of obstruction of the bowel prevail is an indication that such obstruction is due to paralysis, from overdistention, from inhibition of nerve influences or from thrombosis on account of which the blood-supply is cut off.

1. "On the Occurrence and Significance of Cutaneous Hyperalgesia in Appendicitis." James Sherren, F. R. C. S., Eng., Lancet, September 19, 1903.
2. See Trans. American Congress of Physicians and Surgeons, 1903.