

**AN AUSCULTATORY SIGN OBSERVED IN ACUTE ABDOMINAL DISEASES.****BY PAUL W. ASCHNER, M.D.,**ADJUNCT SURGEON AND ASSISTANT IN SURGICAL PATHOLOGY, MOUNT SINAI HOSPITAL,  
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(From the Surgical Services of Howard Lilienthal, M.D., and Edwin Beer, M.D.)

THE methods employed in examination of the abdomen are commonly limited to inspection, palpation and percussion. Cabot says: "Our methods are crude and inexact compared to those applied to the chest. Auscultation is of practically no use." Gerhardt speaks of a single sound and at times a systolic murmur heard over the abdominal aorta. He describes friction sounds heard over the liver, the spleen, or tumors, and over the intestines in case of peritonitis. He mentions the rare finding of signs due to sacculations of air and fluid, as in subphrenic pyopneumothorax. No additional data are found in the works of Sahli or of Brugsch and Schittenhelm.

Believing that some information might be obtained by examining with the stethoscope, auscultation was applied to the abdomen in acute cases. Most of these were cases of appendicitis.

In some patients examined in this way it was found that the heart sounds and the inspiratory murmur were audible over three or four of the quadrants. The heart sounds were somewhat distant and reminded one of the fetal heart sounds familiar to the obstetrician. The inspiratory murmur was audible at times with quiet respiration, at other times only when the patient was requested to breathe more deeply. When the abdomen was opened the peritoneal cavity of patients presenting these auscultatory signs was found to contain free pus, seropurulent fluid or blood (as in a case of ruptured tubal pregnancy). After a number of such experiences it became apparent that the physical sign had some significance and the keeping of data on this point was begun. The unreliability of shifting dullness as a sign of free fluid in the acute abdomen is well known. If this auscultatory sign should prove significant of free fluid it would be of clinical value.

It was suggested by a colleague that cases of ascites ought to present the sign, but it was deduced that it would not be present for the following reason: Ascites is a gradual accumulation of fluid causing stretching of the parietes, whereas the sign appears with a sudden accumulation of fluid under tension. The physical conditions are different. Several cases of ascites in the medical services were examined with negative auscultatory findings in every instance.

Many patients in the surgical wards without abdominal disease were examined and in no instance was the sign described encountered.

Occasionally the heart sounds were audible in the epigastrium or a systolic tone was heard over the abdominal aorta.

**Analysis of Case Records.** 1. Cases with positive auscultatory sign and positive findings at operation, 17.<sup>1</sup>

Of these 17 cases the heart sounds and inspiratory murmur were heard in all four quadrants in 10, in three quadrants (right and left upper and right lower) in 3, in two quadrants (right and left lower) in 3, in two quadrants (right upper and lower) in 1 case. The patients' ages ranged from one to fifty-five years. Shifting dullness was made out in only 2 cases. In 7 cases the usual symptoms and signs of peritonitis (facies, general abdominal rigidity, rebound tenderness) were present. In 8 cases the presence of peritonitis was not considered or seemed very doubtful.

In 2 cases (both infants) aspiration of the abdomen with needle and syringe yielded pus. (For the use of this procedure I am indebted to Dr. Howard Lilienthal.) Both of these were operated upon because sinews of the pus excluded a primary pneumococcus peritonitis.

The findings at operation in these 17 cases were as follows: In every one of this group free pus or seropurulent fluid was found in the peritoneal cavity. In 15 cases this was due to an acute appendicitis with perforation in 7. In 1 it was due to an acute post-abortive metritis. (Examined through the courtesy of Dr. Hiram N. Vineberg.) In another the underlying condition was a purulent cholangitis due to common duct stones. The gall-bladder itself showed only chronic inflammatory changes, the peritonitis apparently resulting from extension through the duct walls.

2. Cases with negative auscultatory sign and negative findings at operation, 12.

In 3 cases of marked abdominal distention in acutely ill patients the absence of the auscultatory sign was of interest, as the possibility of the production of the sign by distention had come up for discussion. The cases were: (1) Incarcerated femoral hernia, (2) obstructing carcinoma of splenic flexure, (3) acute gangrenous appendicitis with reflex ileus.

In 4 cases of acute gangrenous appendicitis and 1 of acute pancreatitis the general symptoms, the widespread abdominal rigidity or marked rebound tenderness strongly suggested active peritonitis. In none was the auscultatory sign present and in none was fluid found in the peritoneal cavity at operation. In a case of penetrating bullet wound in the right hypochondrium with marked rigidity of the upper abdomen the sign was absent and the subsequent course excluded intraperitoneal hemorrhage or perforation

<sup>1</sup> An additional case was recently examined on the pediatric service of Dr. Henry Heiman. It was a case of pneumococcus peritonitis in a child of three years. The auscultatory sign was present and the diagnosis proved by aspiration and culture of the pus obtained from the abdominal cavity.

of a viscus. In the case of a child run over by an automobile the physical findings strongly suggested intraperitoneal injury. The auscultatory sign was absent and subsequent course and operation proved the injury to be confined to the right kidney with production of an "extrarenal hydronephrosis."

In a case of perirenal hematoma of unknown origin and in a case of suspected tubal pregnancy, in both of which the sign was absent, operation proved the peritoneal cavity to be free of blood or fluid.

3. Cases in which heart sounds were heard in one or both upper quadrants only, 4.

Transmission of heart sounds to one or both upper quadrants was regarded as of doubtful significance because of the following cases: In one case of transmission to both upper quadrants a small amount of seropurulent fluid was found in the pelvis. In another case with similar signs no free fluid was found. In a case with heart sounds audible in the left upper quadrant only an acutely inflamed retrocecal appendix was found with no free fluid. In a case showing transmission of heart sounds and inspiratory murmur to the upper quadrants only a small amount of clear serum caused by a twisted Meckel diverticulum was encountered.

4. Cases with negative auscultatory sign and positive findings at operation, 3.

In 2 cases with negative auscultatory findings a small amount of serum was present in the pelvis. In neither case could a peritonitis really be said to exist. In a child of seven years brought to the hospital *in extremis*, with a small, rapid and at times imperceptible pulse with shallow respirations, forty to fifty per minute, auscultation was negative. Operation revealed a diffuse purulent peritonitis. The heart sounds were barely audible over the precordium, and this in itself precluded transmission to the abdomen.

5. Cases with positive auscultatory sign and negative findings at operation, 2.

One of these was a woman, aged fifty-two years, with a markedly distended colon and an empyema of the appendix without free fluid in the abdomen. The second was a boy, aged ten years, with an acute gangrenous appendicitis, considerable distention of the small bowel, but no free fluid.

These 2 cases prove that the sign is not an infallible one and may be occasionally caused by distention of the bowel.

**Conclusion.** Auscultation of the abdomen in acute conditions accompanied by seropurulent or purulent exudation into the peritoneal cavity reveals a physical sign which is present in a high percentage of cases. Of 20 such cases the sign was positive in 18, doubtful in 1, and negative in 1. The last was an infant *in extremis*. In only 2 of the cases was shifting dullness demonstrable. In 8 cases the symptoms and usual physical examination did not suggest the presence of peritonitis.

In 2 cases presenting the sign and not showing the expected peritonitis marked intestinal distention was present. In 3 other cases of distention without peritonitis the sign was not present. Further observations will be necessary to determine how much this factor vitiates the value of the sign.

Only 1 case of intraperitoneal hemorrhage, a ruptured tubal pregnancy, was observed, and it showed the sign. Observations on traumatic conditions of the abdomen will be of interest in this connection.

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### A CONTRIBUTION TO THE STUDY OF LETHARGIC ENCEPHALITIS IN ITS RELATION TO POLIOMYELITIS.<sup>1</sup>

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SINCE lethargic encephalitis, so called, has appeared in pandemic form it has been most intensively studied by pathologists and clinicians the world over. As a result of these studies it has not been possible to arrive at a definite conclusion whether it is a distinct disease entity or another phase of epidemic poliomyelitis. The problem uppermost in the minds of investigators now is how close is the relation between lethargic encephalitis and poliomyelitis? In this connection we have taken up the study of the effect of serum of patients recovered from lethargic encephalitis upon the virus of poliomyelitis *in vitro*.

It is a well-established fact, as was shown by Flexner and Lewis, Netter and Levaditi, Roemer, and Anderson and Frost, that serum of patients recovered from poliomyelitis neutralizes virus of poliomyelitis *in vitro* and also protects monkeys from the disease when injected with such a mixture. It is also known that normal human serum does not, as a rule, neutralize the virus.

Following are the protocols of our experiments:

EXPERIMENT 1. March 6, 1920, Macacus A was injected intracerebrally with 0.5 c.c. of a mixture of poliomyelitis virus and serum of patient Miriam S., aged sixteen years, three months after recovery from lethargic encephalitis, prepared in the following manner:

<sup>1</sup> Read before the Association for Research in Nervous and Mental Diseases, December 29, 1920, New York City.