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TUBERCULOSIS OF THE PERITONEUM,  
WITH THE FORMATION OF A  
SAC SIMULATING AN OVARIAN CYST,

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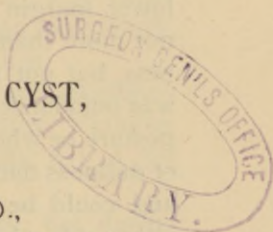


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THE above title indicates the feature of special interest presented by the following case of tuberculosis of the peritoneum, which is considered of sufficient importance to be published.

Maggie C——, black, aged 12 years, admitted to the Children's Hospital, August 8, 1879.

The only history of her previous condition was the simple statement that in January previous she was "sick with a deep cold and swelling of the feet," which swelling disappeared, but was followed by enlargement of her belly, which had continuously increased.

Condition on admission, August 8th. (Notes by Dr. S. S. Adams, house physician). Abdomen greatly enlarged, measuring in circumference at umbilicus 29 inches; from umbilicus to superior spinous process of left ilium  $7\frac{7}{8}$  inches, to right  $7\frac{1}{8}$  inches; from Xiphoid cartilage to pubis 13 inches, to umbilicus 7 inches.

When the patient was lying upon her back the abdomen



remained pointed, with highest elevation at umbilicus. The area of dulness was circumscribed by a line extending from a little below the superior spinous process of the left ilium in a curvilinear direction upwards, passing one inch above the navel to the right near the inner border of the right flexure of the colon and thence downwards, rather abruptly, to the superior spinous process of the right ilium. Around this area the abdomen was tympanitic, especially along the descending colon and over right lumbar region; less so over left lumbar region. In the left iliac fossa along the lower margin of the dull area there was a narrow border, not more than a finger's breadth, of greatly diminished dulness, but not resonance. The outlines of this dull region was uninfluenced by change of position, either in the sitting posture or when lying upon either side. Within the area of dullness fluctuation was very distinct in every direction, and could be detected, though much less distinctly, on either side where the percussion sound was tympanitic, as well when each palpitating finger was without, as when one was outside and the others within the limits of the area of flatness. Over the entire dull region there was soreness, and tenderness to moderate pressure. The patient complained of pain in this region, which at irregular periods had been acute. There was some puffiness about the eyes. Emaciation was marked; features pinched; appetite fair; bowels regular.

Respiration was frequent. Sounds normal except in right inter-scapular region, where there was diminished resonance and marked puerile respiration. Cough occasional and trifling. During the subsequent history of the case, without any noticeable augmentation of the cough, or appreciable alteration in the respiratory sounds, the respiration continued frequent, occasionally the number of respirations did not exceed twenty per minute, but usually ranged between twenty-five and thirty-five, and several times numbered forty.

The temperature chart, representing the course of the fever from the date of admission till the fatal termination, exhibits constant daily differences between the maxima and

the minima, varying from one to three degrees. Several times it was above  $104^{\circ}\text{F}$ . marking periods of inflammatory exacerbations, attended with acute abdominal pain and very great tenderness. On several occasions the minima were subnormal. During the week preceding death there occurred a gradual and regular defervescence, with daily lessening maxima and minima, the lowest maximum being  $98^{\circ}$  with a subnormal minimum as low as  $94.5^{\circ}\text{F}$ . During this period the pulse fluctuated considerably, without correspondence with the temperature excursions. The respiration also varied, and was less frequent than previously, but more uniform in its variations than the pulse.

The pulse was always frequent and small, and exhibited correspondence in frequency to the temperature changes, increasing with the rise, and slowing with the fall of the body heat.

The bowels were usually moved once daily, but during the week immediately preceding death there was a moderate diarrhoea, the stools consisting of a dark, tarry, and exceedingly offensive liquid.

The urine was scanty, frequently the daily quantity did not exceed eight ounces, and occasionally was much less.

Examination of urine by Dr. E. M. Schaeffer Sept. 13th :

"Color natural ; turbid and frothy. Reaction acid ; sp. grav. 1028 ; Phosphates with heat ; no albumen or sugar. Large number of granular casts, for the most part straight and narrow. No blood, pus or oil globules. An excess of renal epithelium. A few crystals of oxalate of lime."

From Sept. 23d to Oct. 5th, the average daily discharge of urine was much increased, amounting one day to forty-two ounces. After this the abdominal distention was greatly diminished, and though it subsequently increased, it did not again reach the extent as previously stated at the date of her admission.

After this period of considerable increase in the daily average amount of urine the entire abdominal region became tympanitic, the dull area, as previously described, markedly so. For a time no fluctuation could be recognized. Subsequently, however, the partial refilling of the sac with fluid



was apparent, as fluctuation could be detected by palpating from side to side at the outer lateral borders of the previously described area of flatness, whilst over the surface of this region tympanitic resonance was pronounced. At no time during the after-life of the patient was there any circumscribed area of flatness within the previously described limits, or anywhere in the abdominal region, except in the localities of the solid organs. This tympanitic resonance of the summit surface (patient lying upon her back) of the circumscribed dull region is explained, as shown by the dissection, by the escape of gas from the intestines into the sacculated space.

On August 28th the lips became œdematous, and, several days afterwards, the pudendal labia and nymphæ were enormously swelled. The œdema extended to the abdominal integument. These infiltrations subsided spontaneously.

During her residence in the hospital she suffered several severe exacerbations, characterized by rigors, abdominal pain and tenderness, and sudden high elevation of temperature.

From the date of admission the case was regarded as one of tubercular peritonitis and, consequently, hopeless. The treatment consisted in rest, a nutritious and easily digested diet, tonics, cod liver oil, and the syrup of the iodide of iron. The iodide of potassium was given for many days. It seemed at times to produce a very marked diuresis. To it was ascribed the great increase in the quantity of urine which relieved the distention from fluid accumulation in the abdominal cavity. She died on Nov. 5th.

Post-mortem six hours after death by Dr. Adams: Body emaciated; rigor mortis well marked. Circumference of body at umbilicus 22 inches. Heart pushed upwards, large and flabby. Right auricle contained a white clot as large as a pigeon's egg, extending into the right ventricle. Right ventricle normal.

Lungs pale anteriorly, congested posteriorly (hypostatic). Adherent to diaphragm on both sides. In the posterior, inner angle of the upper lobe of the right lung was a caseous mass larger than a walnut, which approached the sur-

face, and may, perhaps account for the altered physical signs recognized in the right inter-scapular region on August 8th.

Upon opening the abdominal cavity a quantity of very offensive gas escaped. The walls of the abdomen were closely adherent to a mass which occupied the entire cavity and could only be separated by a careful dissection. No portion of the intestines could be seen, only a small part of the stomach being in view. At the lower border of this mass was a pouch which was partly adherent to the abdominal walls above the pubis and dipped down between the uterus and bladder. It contained about a quart of most offensive, black, fæcal-looking, granular, semi-solid material. Pressure upon this pouch caused a discharge through the anus of fluid similar in character to that which filled it. A similar sac was located in the left inguinal region and another in the left hypochondrium, but were much smaller. The large tumor could not be separated from the abdominal viscera and it together with all the organs were removed *en masse* as shown in the accompanying figure. (Next page.)

“The anterior wall of the sac was comprised of the parietal peritoneum, which in some parts was nearly one inch in thickness, produced by successive layers of firmly organized fibrous exudation. Large yellow tubercles, size of peas, were scattered throughout the different layers. The omentum, mesentery and mesocolon were also thickened by fibrinous exudations.

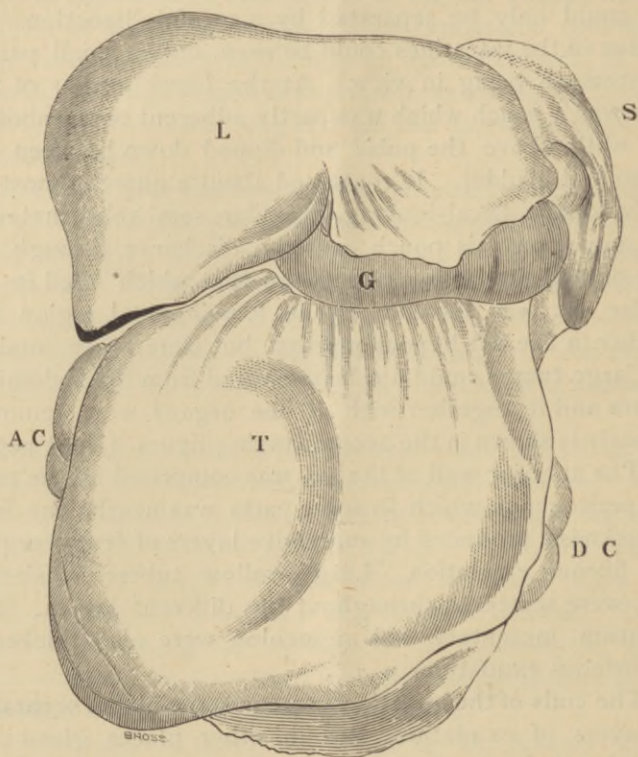
“The coils of the intestines were in some places separated by layers of exudation, and in other places glued and matted together so that they were fixed in one position.

“The mesenteric glands were enlarged and in a state of caseous degeneration. Stomach was bound down on all sides by adhesions and was separated with great difficulty. It was free from tubercles.

“The duodenum was involved in a mass of exudation. It, the jejunum, and the larger intestines were free from tubercles. The intestines were so bound together by the exudation above described, that it required careful dissection to free them. The solitary glands and Peyer's patches



were inflamed and enlarged in all parts of the intestinal tract. Tubercles were only found in the ileum. The tubercles as a rule were in the serous coat, but in many places they had extended to the muscular and mucous coats. In the ileum perforations were found—upper and middle parts—; near the cæcum there was a large one.



L. liver ; S. spleen ; G. stomach ; A.C. ascending color ; D.C. descending color ; T. Tumor. Dissection of this mass by Drs. Acker and S. S. Adams.

These perforations took place in the Peyer's patches. In many places in separating the exudation from the ileum, small perforations were occasioned by tubercles being torn from the intestine and adhering to the exudation.

“Liver firmly attached to the diaphragm by adhesive inflammation : on the under surface were a few large tubercles—size of peas. There were also some along the sides of



the gall-bladder binding it to the liver. Normal quantity of bile. The left lobe of the liver was small and thin and appeared to form a part of the diaphragm, so intimate was the connection between them. The liver substance was normal. No tubercles seen. The great liver vessels situated in a large tuberculous mass, consisting of tubercles, fibrinous exudation and mesenteric glands enlarged and undergoing caseous degeneration. The aorta, vena cava, lymph vessels, nerves, pyloric and cardiac ends of stomach and duodenum were also involved in this mass."

"Spleen was firmly adherent to the diaphragm. About  $\frac{1}{3}$  of an inch between it and left lobe of the liver. Tissue normal ; no tubercles."

"*Kidney*—The left was surrounded and bound down by exudation ; capsule easily removed ; no tubercles. The right was adherent by the capsule to the right under surface of the liver ; capsule easily removed ; Substance normal ; no tubercles."

Dr. Acker adds that the " case was one primarily of general tubercular peritonitis which had occasioned successive fibrinous exudations. All parts covered by the peritoneum and its prolongations were enclosed by this exudation which in most places had become organized."

"Secondary eruption of tubercles had taken place in the ileum, liver, and pleura and along the diaphragmatic attachments of the lungs, but in each case the tubercles were few in number. In fact, the organs were remarkably free from them. He judged in all cases by the naked eye appearance. Perforations of the intestines occurred in the ileum—upper, middle and lower part. There were not any communications between the different coils of the intestines. The abscesses or sacs were encapsulated by the fibrinous exudation."

"The tubercles were the large yellow variety and were about the size of a pea. There were no small gray ones seen."

The points of special interest in this case relate to diagnosis. The brief and meagre history presented but the single fact—that the disease had commenced eight months previous with a " deep cold " with subsequent and progress-

ive enlargement of the abdomen. At the examination on the day of admission, there was no difficulty in marking out the immovable, dull and fluctuating area occupied by the large sac, and delineated as the tumor in the drawing; nor was there any doubt in regard to the adhesions of the entire circumference of this fluctuating area to the abdominal parietes. These observations, together with the history, fever, emaciation, slight cough and rapid progress of the disease directed attention to the tuberculous nature of the malady. It was believed then, as disclosed by the post-mortem, and dissection of the tumorous mass, that the walls of the sac or abscess were formed in front by the parietal peritoneum and posteriorly by the agglutinated intestines. If the drawing of the contents of the abdominal cavity be studied in connection with the record of the examination, it will be seen that the outlines of the fluctuating area were very definitely and accurately described. The tympanitic resonance on each side was easily understood, but why fluctuation was present outside of the margins of the dull area where the percussion sound was tympanitic, was not understood until explained by the dissection of the mass. The drawing shows that the ascending and descending colon were attached along the borders of the fluctuating and dull area, which furnished the tympanitic percussion note along the sides. Behind these portions of the intestine the large abscess dipped and other smaller ones were found. This fact explains satisfactorily, why, as recorded at the examination, fluctuation could be "detected, though much less distinctly, on either side where the percussion sound was tympanitic as well when each palpating finger was without, as when one was outside and the other within the limits of the area of flatness." In view of the frequency with which multiple sacs or abscesses are found in cases of tubercular peritonitis this explanation of the phenomena ought not to have escaped recognition at the time of the examination. It was, however, believed at that time that the fluid was of a serous character. But the one cyst was recognized during the lifetime of the patient and the outer borders of the area of dullness were thought to circumscribe its extent



Nevertheless, the memoranda of the examination record the fact that resonance was less in the left than in the right lumbar region, due, as shown by the dissection, to the presence of one of the smaller abscesses. In the left inguinal region, below the lower margin of the large tumor or abscess, as shown in the drawing, and described in the notes of the examination, as a border of greatly diminished dulness, but not resonance, was located another abscess, which was not recognized during life. Nor does the post-mortem discover the explanation of a defined margin of flatness marking the left inguinal limit of the tumor, (see drawing) immediately below and contiguous to which was another abscess as large as a goose's egg, which gave on percussion a note of so much less dulness as to enable the examiner to detect the difference. It may be, that the "border, not more than a finger's breadth, of greatly diminished dulness, but not resonance," as described in the notes of the examination, was even below the second contiguous abscess, but the drawing (which was made by Professor Kleinschmidt without any knowledge of the history or diagnosis of the case) does not sustain this supposition. Its proximity to, and overlaying of, the sigmoid flexure may, probably, furnish a more rational explanation.

In the memoranda of the examination the region exhibited in the drawing as the tumor is described as a circumscribed, dull and fluctuating area. During the course of the disease, after the quantity of the urine had been greatly increased, ascribed at the time to the diuretic effect of the iodide of potassium, this circumscribed, dull and fluctuating area became tympanitic. At the time the explanation seemed very plain. Under the influence of treatment the fluid accumulation, believed to be serous, had been absorbed and eliminated through the kidneys, followed by collapse of the cyst and consequent coaptation of the posterior wall, constituted of agglutinated intestines, with the anterior wall or parietal peritoneum. The tympanitic resonance was due to the contact of the intestines distended with gas.

Subsequently this space partially refilled, but its summit surface remained resonant. The dissection disclosed the

existence of several perforations of the intestinal walls, which suggest the probability that gas escaped through some one of these perforations into the original cyst. After this, fluid was distinctly recognized in the cyst by palpating from side to side, that is, when the patient was lying upon the back, the summit was tympanitic, whilst at its lowest lateral margins fluctuation was distinctly recognized. It was believed, then, that air had escaped into the cyst from the intestines; and this view seems to be corroborated by the dissection of the tumorous mass, yet if the original contents of this cyst was pus and had escaped through a perforation of the intestinal wall, there ought to have been some confirmatory proof of its discharge through the anus. The current history of the case recorded daily by Dr. Adams, the house physician, does not supply such evidence. It was from Sept. 23d to Oct. 5th that the quantity of urine greatly increased, and immediately after this the dullness of the umbilical region entirely disappeared, yet not until the week immediately preceding death (Nov 3d) was there any diarrhœa. At the time of the dissection, this cyst, or abscess as the case may be, was empty. These circumstances force me to the conclusion that at the time of the first examination it did not contain a serous fluid which was absorbed; and that the connection between it and the intestinal tract was subsequent, and caused by perforating ulcers beginning in Peyer's patches, as described by Dr. Acker. The fact that the summit surface of the original circumscribed dull and fluctuating area remained, after the absorption of its fluid contents, tympanitic, whilst its posterior or base gave indubitable evidence of the presence of fluid, is conclusive that the cyst was at least partially filled with gas, which may have entered it through the perforated walls of the intestines,\* but it does not prove that the original contents of the cyst escaped through a perforation of the intestinal wall. If the contents of the sac were, as believed at the time of admission, serous, which subse-

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\* It is not, however, impossible that the gas may have been generated in the sacculated space, as such cases are recorded.



quently, as previously suggested, was absorbed, the tympanitic resonance of the region which followed was due to the contact of the intestines with the abdominal walls. Following these occurrences, the ulcerated Peyer's patches may have perforated the intestinal wall, gas escaped in the cyst, succeeding by the formation and accumulation of a purulent fluid.

The observation of Dr. Acker that the solitary glands and Peyer's patches were inflamed and enlarged in all parts of the intestinal tract, and that the perforations took place in the agminated glands of Peyer is very interesting, inasmuch as it, presumptively, locates the beginning of the tuberculous process in the intestinal follicles, and points to the secondary formation of the encapsulated abscesses in immediate connection with the disease of Peyer's patches. This suggestion is corroborated by the fact that tubercles were only observed in that portion of the intestinal tract (ileum) where Peyer's patches are largest and most numerous.

During the examination at the time of admission the possibility of the presence of an ovarian cyst was considered, but was excluded by the facts elicited at that time. A few days observation, and examination of the pulse-rate and temperature chart confirmed the diagnosis of tubercular peritonitis. The probability of the formation of a cyst in cases of tubercular peritonitis simulating ovarian dropsy is very remote. I have not examined the literature of the subject, and can refer only to the one case observed by Kaulich, in which "the partial sacculation † of fluid by means of firm membranes produced phenomena which gave rise to a similarity to an ovarian cyst." At page 296 another case is recorded in which there was found a large, thin, purulent "effusion in the parietal cavity, together with numerous adhesions between the abdominal viscera producing tumors and encysted masses;" and also an ovarian cyst as large as a child's head.

The case exhibited another phenomenon worthy of notice.

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† Ziemsen's Cyclopedia, Vol. VIII, p. 336.

During the progress of the disease it frequently occurred that the temperature fell below the normal. This circumstance I have observed very often in phthisical diseases, and have learned to regard it as a symptom of unmistakable significance even in cases before I could locate the morbid process. The clinical records of the Children's Hospital will furnish numerous illustrations of subnormal temperatures occurring during the progress of phthisical diseases, and some instances of prospective diagnoses of tuberculous developments were based upon the repeated occurrence of subnormal temperatures during convalescence from other diseases, in the absence of any other symptom worthy of note. I am not aware that this fact has been previously stated with so much emphasis, but it has been noticed by several writers. Bauer, at page 295, Vol. VIII, Ziemsen's Cyclopedia, supplies the temperature chart of a case in which a purulent fluid was found in the peritoneal cavity, together with numerous adhesions and encysted masses. During the progress of this case the temperature frequently fell below 98.4°. Ruehle (Vol. V., p. 568, Ziemsen's Cyclopedia) in discussing the febrile phenomena of pulmonary consumptives, says in chronic cases "the minima are generally normal, or a little below the normal." Again, "there may be high and low minima, subnormal temperatures, and all these for a few days only or for weeks together." And again at page 599 he adds, "equally ominous are high evening temperatures, or high maxima at any other time, even when the minima are normal, and especially if they are subnormal."





