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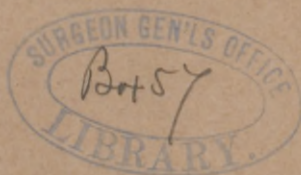
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## THE SIGNIFICANCE OF PUS IN OVARIAN FLUIDS.

BY JAMES R. CHADWICK, M. D.

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This exceptional ingredient of ovarian fluids has been very insufficiently considered by writers upon ovarian tumors, whether from a clinical or a pathological stand-point.

As pus is always the result of inflammation in some form, we should naturally expect that its presence in ovarian fluid would be universally accepted as evidence of this process; yet nowhere do I find this to be the case.

The only indications of cystic inflammation adduced in the clinical histories of ovarian tumors are the symptoms attributable to septic or pyemic fevers; *i. e.*, chills, high pulse and temperature, general malaise, emaciation, etc. Pain seems to be generally absent, unless the peritoneum participates in the inflammatory action. These symptoms are undoubtedly well marked and characteristic in acute inflammation of the cyst-wall, and demand the early removal of the tumor by operation. The ten cases of ovariectomy, recently reported by Keith,\* in which the cysts were found to be the seat of acute suppuration, are proofs of the good results which may be expected from operative procedures.

Kiwisch,† Baker Brown,‡ Klob,§ Jos. Kroker,|| J. A.

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\* On Suppurating Ovarian Cysts. Edinburgh Medical Journal, Feb., 1875.

† Klinische Vorträge, 1852, Abth. II., p. 85.

‡ On Ovarian Dropsy, 1868, p. 12.

§ Pathologische Anatomie des weiblichen Sexualorgane, 1864, pp. 361, 362.

|| Ueber die Ursachen der spontanen Perforation von Ovariencysten. In Diss., 1869, p. 16.



Baldy,\* Peaslee,† Gallez,‡ Barnes,§ Spiegelberg,|| and a few others, make very brief allusions to acute inflammation of ovarian cysts. But none seem to be so conversant with this complication as Mr. Spencer Wells; hence, I offer no apology for quoting from him at some length.

"The ovarian cysts, and more especially the complicated kinds, are liable to become inflamed, either spontaneously or as the consequence of some accident or operation, such as tapping. The disease may run on rapidly with intense symptoms and general peritonitis to a final termination; or it may be more localized, and lead to suppuration in the cavities. This may go on for some time, with the production of pus as in a common abscess; or the contents of the cysts may be converted into any of the foul, disgusting fluids, the result of decomposition. The fatal termination, if the cysts be not removed, may be due to diffuse peritonitis, but more commonly to septic or pyemic fever, the result of blood changes set up by absorption, or by admixture, more or less direct through the vessels of the cyst, of the putrid fluids or gases with the blood. In other cases, ulcerative action in the walls takes place; they then give way, and are perforated."¶

The concluding paragraph of this quotation describes the special condition to which I propose to call attention in this paper. I cannot better introduce the subject than by citing the observation upon which is based the subsequent argument.

\*Des accidents de la ponction abdominale des kystes de l'ovaire. Thèse de Paris, 1859, p. 23.

† Ovarian Tumors, 1872, pp. 173, 175.

‡ Histoire des kystes de l'ovaire, 1873, p. 252.

§ Clinical History of the Diseases of Women, 1873, pp. 343, 344, 360.

|| Ueber Perforation der Ovarienkystome in die Bauchhöhle. Archiv für Gynäkologie, 1870, Bd. I., Heft. 1, p. 67.

¶ Diseases of the Ovaries. London, 1872, p. 78.

## OVARIAN CYST; ULCERATION OF THE CYST-WALL; PERFORATION WITH FATAL RESULTS.\*

February 24, 1874. — Josephine de L., aged 20 years, single, had pain in the right hypochondrium five years ago, which recurred after varying intervals for three years, was absent for a year, but for the past twelve months has been very severe, and has extended to the other side. A swelling appeared in the right hypochondrium nine months ago, and has since gradually extended to the whole abdomen, — the girth now measuring thirty-nine inches. On percussion the abdomen was flat throughout. The only symptoms had been headaches, palpitation, tenderness of the abdomen, and occasional vomiting.

On March 22d the patient was tapped, and twenty-eight pints of a clear, nearly colorless fluid of syrupy consistence drawn from the tumor. On April 24th she was discharged.

On September 5th she re-entered the hospital with the abdomen again distended, and suffering from vomiting and dyspnoea. Two days later ten pints of a clear mucilaginous fluid were drawn with the trocar. On September 10, 1874, she was discharged.

On January 7th, 1876, she reported that the cyst had not begun to refill until February, 1875, when she had a severe fall; since that time she had been tapped, outside of the hospital, four times, at intervals of five, three, three, and two months, respectively, the last having been two and a half months ago. No new symptoms had occurred; the tenderness in the right hypochondrium was very marked.

On January 20th twenty-seven pints of a "*dirty, gray-colored fluid, with a ropy sediment,*" were drawn with the trocar. The fluid (specific gravity 1050) contained albumen, and a small quantity of sugar (?) *pus* and mucus. The patient was discharged on January 22.

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\* For the notes of this case I am indebted to an abstract from the records of the hospital, by Dr. C. W. Brown, late House Physician, and to a brief synopsis that was published by Dr. Edes (in whose service the case occurred), in the Boston Medical and Surgical Journal for Aug. 17, 1876.



She re-entered on March 6th, and was tapped on the 14th; twenty-seven pints of a fluid *resembling pea-soup* were removed. On March 16th she was discharged.

On April 18th she entered, with severe pain in the back and right side of the abdomen. Tenderness, on pressure, extended throughout the abdomen. On the next day twenty pints of purulent fluid, the last part of which was thick and flocculent, were drawn with the trocar. She suffered severe cramp-like pains for twenty-four hours, requiring large doses of morphine. On the 22d she was discharged.

On May 24th she re-entered, with the abdomen again fully distended, and quite painful; pulse, 100; temperature, 98.4. On the next day nineteen pints of a milky fluid were removed, the last portion being thick and ropy. There was no pain subsequent to the tapping; and she was discharged on the 29th of May.

At this operation I was present, by Dr. Edes' request, and tried ineffectually to discover some cause for pus in the fluid. There was no fever or unusual tenderness in the abdomen.

About three weeks later the patient called at my office, at Dr. Edes' suggestion, to make arrangements for ovariectomy at her home. The tumor had then nearly refilled. In consequence of the hot weather to be expected in the month of July, I recommended that she should be again tapped in the hospital, as soon as necessary, and that the operation should be performed at or about August 1st.

On June 28th Miss L. entered the hospital in a state of collapse, with no pulse at the wrist, and vomiting a "coffee-ground" fluid. The tumor was tapped, and much purulent fluid evacuated. She sank during the operation, and died twenty minutes later. It was afterwards learned that she had been taken suddenly with extreme pain and vomiting on the day before entrance.

"The *autopsy* disclosed general peritonitis. On the right side of the median line lay the greater part of a compound ovarian cystic tumor, the largest cyst being adherent to the abdominal walls at the median line, as well as slightly to the omentum. Its walls were from a sixteenth to an eighth

of an inch in thickness, roughened on the inside, and contained a somewhat gelatinous fluid, with much pus. At the upper part, and somewhat to the left, was a small perforation, perhaps one-eighth of an inch in diameter, which corresponded to a reddened, rough, and ulcerated patch upon the inside. It was about four inches above and to the left of the place where the trocar usually entered the cyst. The other cysts were much smaller and filled with clear gelatinous material."

The wall of the main cyst showed several large raised ridges, without any corresponding depressions on the outside; these formed the borders of several quite deep and large pouches, so that they seemed to be the remnants of the walls of former subordinate cysts. Many of the ridges were covered with a pseudo-membrane, beneath which was granulation-tissue, with absence of epithelium; in other words, they were the seat of ulceration. There were many extensive irregular patches of similar character, intersected, and very generally bounded, by slightly raised ridges of firm, white tissue, seemingly cicatricial. In other parts these ridges formed a complicated, radiating net-work, with intervening pouches of healthy cyst-wall. Fully two-thirds of the cyst-wall showed such evidences of present or past ulceration.

Dr. R. H. Fitz has kindly sent me the following description of the microscopic appearances:—

"That portion of the cyst-wall presenting the roughened papillary appearance, and apparently bearing a false membrane, showed an occasional papilla, and a membrane composed of evident agglomerated pus corpuscles. Directly beneath this membrane there was no cylindrical epithelium, though at intervals pouches extended downwards for a short distance, and were lined with cells of such a character.

"The tissue beneath the false membrane occasionally resembled a granulation tissue, the numerous cells being collected about rather large and frequent vessels running vertically towards and nearly to the surface. The smoother,



whiter portions of the wall of the cyst were covered with no epithelium, and were composed of parallel bundles of fibres, separated by broken chains of cells. These parts of the cyst were more fibrous and less cellular than the more deeply seated portions."

It will be noticed in the above history that a "clear, mucilaginous fluid" was obtained from the cyst on Sept. 10th, 1874; that the character of the fluid removed at the four tapplings, outside of the hospital, during 1875, is unknown; but that on Jan. 20th, 1876, and at every subsequent tapping, the fluid contained *pus*. Pus was consequently forming in the cyst for at least five months before the patient's death, and perhaps for several months previously.

On the other hand it will be remarked that there were at no time such symptoms of inflammation of the cyst-wall as are indicated, even though briefly, in medical literature. There was no general malaise, no loss of strength or flesh, no fever, no chills; the pulse and temperature were normal on the only occasion when they were recorded.

This discrepancy between the patient's condition and the purulent character of the fluid produced a deep impression upon my mind when I was present at the tapping on May 24th, and led to a long, but futile search for an explanation in the works upon the pathology and clinical features of ovarian tumors.

The fatal result and autopsy have, happily, revealed "the missing link." The formation of the pus is shown to have been due, not to acute inflammation, which might have been recognized, but to a form of chronic inflammation of the lining of the cyst-wall, which may be designated as *ulceration*. This process undoubtedly had its origin in the frequent punctures of the cyst with the trocar, and is the pathological condition to which many authors allude; but which has—so far as I can learn—never been recognized prior to removal of the tumor, or to the death of the patient.

This case, therefore, suggests that pus in the fluid taken



from an ovarian cyst is, in the absence of symptoms pointing to acute inflammation, pathognomonic of ulcerative action in the cyst.

The *perforation* of the cyst-wall, in the course of this process, indicates the imminent danger to which patients are subject, under these circumstances, and calls for quite as prompt operative interference on the part of the surgeon as do the symptoms of acute inflammation.







