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Intra-Peritoneal Hæmatocele Considered as a Consequence of Ruptured Tube-Pregnancy, with Report of a Case

BY

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INTRAPERITONEAL HÆMATOCELE CONSIDERED AS A CONSEQUENCE OF RUPTURED TUBE-PREGNANCY, WITH REPORT OF A CASE.<sup>1</sup>

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Two years ago, I invited the attention of this Society to the surgical treatment of *extra*-peritoneal hæmatocele. I then urged that, in a vast majority of cases, the extravasation should be left alone, as absorption would take place ; but that in certain other cases, such as recurrent hemorrhage and suppuration, of which I gave an illustrative instance, the bleeding-point should be controlled by laparotomy. This year, I beg to call your attention to *intra*-peritoneal hæmatocele, and to urge precisely the same central idea in treatment. If it were necessary to offer any excuse for presenting this subject, other than its inherent surgical importance, it would be that in England the whole question is not only a moot one in scientific circles, but has recently figured as a problem in medical jurisprudence. In this latter relation the question raised was, essentially, should the uterine appendages be removed on the affected side in cases of intra-peritoneal hæmatocele? And if so, why? The answer given was in the affirmative, because, it was alleged, that in the cases operated upon the hæmatoceles resulted from ruptured tubal pregnancies, and that the extravasation was perpetuated by a bleeding-point in the rent in the tube. It is my purpose to devote this paper to a partial discussion of this relatively new postulate in abdominal surgery, rather than to a systematic study of accumulations of blood within the peritoneal cavity.

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<sup>1</sup> Read before the Ohio State Medical Society, at Toledo, June 16, 1887.



In examining the early literature of this subject, one is struck with the fact that writers on tubal pregnancy never failed to speak of rupture of the sac as a fruitful cause of hemorrhage into the abdominal cavity; yet, when they began to discuss this latter condition under the head of hæmatocele, they almost invariably failed to speak of tubal pregnancy as an etiological factor. This, indeed, is true of a large number of our modern authors. If, therefore, we desire to get the views of authors, early or modern, on this important question, we have to examine their utterances under the head of tubal pregnancy rather than hæmatocele. This holds true of Duverney's case, recorded as having occurred as early as 1712. It is stated by Mr. Lawson Tait,<sup>1</sup> in the "Ingleby Lecture" for 1886, that Bernutz,<sup>2</sup> in 1848, was the first to recognize the causal relationship existing between tubal pregnancy and hæmatocele, and to indicate the proper line of treatment, viz., laparotomy and ligature. I am disposed to accept this claim for Bernutz, so far as it relates to a suggestion of treatment; but I must insist that all the *essential conditions* of intra-abdominal accumulations of blood from ruptured tubal pregnancy were recognized and described<sup>3</sup> by one of Mr. Tait's own countrymen, Dr. John Burns, of Glasgow, as early as 1814. It is true, Burns does not use the word "hæmatocele," which was coined by Nélaton a quarter of a century later, and which is such a positive misnomer that it had better never have been coined at all.

Burns, however, said that "the sac might burst and the patient die from hemorrhage." He clearly described the subsequent changes when he said that "irritation is produced, inflammatory symptoms supervene, and hectic takes place." He still further indicated his insight into these cases when he said of them that "the most frequent

<sup>1</sup> Lancet, October 30, 1886.

<sup>2</sup> Bernutz and Goupiel: Diseases of Women, translated by Meadows. New Sydenham Society, 1866.

<sup>3</sup> Principles of Midwifery, by John Burns, edited by James, vol. i., p. 168. Philadelphia, 1817.

termination is that by inflammation ending in abscess." And I know no better way to round out a description of what is now known as hæmatocele than by employing Burns' observation that the suppurating contents of a burst tubal pregnancy "might be enclosed in a kind of cyst of lymph." Blundell,<sup>1</sup> writing in 1830, recognized the same condition, and said that he did not doubt that "many women die in this way, but, being buried without examination, the real cause of their death is never ascertained." He even went so far as to *mention* the expediency of abdominal incision for the control of the hemorrhage, but doubtless under the pressure of the mediæval conservatism of Guy's Hospital—a conservatism which still exists in that institution—he abandoned the idea, leaving it to be again suggested by Bernutz thirty years later, and finally to be realized by Mr. Lawson Tait after the lapse of a half-dozen decades. Between Blundell and Tait, numerous writers touched upon both topics, but relatively few of them recognized that tubal pregnancy caused intra-peritoneal hæmatocele. As soon as Nélaton, and, subsequently, Bernutz and Goupiel, began to write upon hæmatocele, the profession appeared to drift away from the definite etiology and pathology so clearly outlined by John Burns, until latter-day authors attribute the condition to almost every other than what I believe to be the one most fruitful cause. One of them,<sup>2</sup> while not entirely ignoring tubal pregnancy as a cause, manages to so hide it under glittering generalizations that the obscuration amounts to a negation. Thus we are told that hæmatocele may come from: "1, Reflux of blood from the uterus; 2, direct outflow from the pelvic or lower abdominal blood-vessels; 3, metastasis, or transudation in certain blood diseases." Of these three general conditions the second is, to my mind, the only one not open to the most rational doubt. The valve-like arrangement of the tubal endothelium is sufficient to subject the first

<sup>1</sup> Principles and Practice of Obstetrics, p. 442. Washington, 1834.

<sup>2</sup> Harris, Internat. Encyclop. of Surgery, vol. vi., p. 823.

proposition to a fatal uncertainty. I entirely agree with Emmet,<sup>1</sup> that the "contents of a distended uterus never pass into the peritoneal cavity unless by rupture of that organ itself or of the uterine portion of the tube, which may have become dilated." The metastatic doctrine, considered in this relation, lacks that confirmation which would justify us in saying that the extravasation is anything else than "a direct outflow from the pelvic blood-vessels." It strikes me that this classification must finally resolve itself under the one head. But why should the lower abdominal or pelvic blood-vessels rupture? I am aware that, as a consequence, generally, of repeated and frequent pregnancies, the intra-pelvic veins sometimes become varicosed; and that, under the pressure of premenstrual congestion, pelvic inflammation, or mental shock, they sometimes rupture, but in that instance the escape of the blood is beneath the fold of the broad ligament and, consequently, extra-peritoneal. And here I want a word about an extra- becoming converted into an *intra*-peritoneal hæmatocele. It strikes me in view of the ease with which the peritoneum can be peeled off the pelvic and abdominal walls, that it would yield its normal adhesion rather than rupture in its continuity to accommodate the pressure of the increasing clot. As a consequence, I believe that the cases are few and far between in which the peritoneum ruptures from the mere force of the circulation, and permits a clot which had formed outside of it to escape into the abdominal cavity. I have been forced to this view by several cases<sup>2</sup> of extra-peritoneal hæmatocele upon which I have operated, and in some of which the peritoneum was pushed as high up as the umbilicus. In these instances the resistant power of that membrane was put to the test, and not found wanting. In one case, in particular, the rupture and extravasation were the results of mental shock occurring at the menstrual period; but in that case, in which the

<sup>1</sup> Emmet : Prin. and Prac. Gynecology, p. 242.

<sup>2</sup> Transactions of the Ohio State Medical Society, 1885.



accumulation was the largest I have ever seen or read of, the peritoneum did not rupture. It is not designed by this evidence, which is far too limited to serve for general conclusions, to deny, much less to disprove, the doctrine that hemorrhage from veins situated outside the peritoneum may cause, primarily, extra-peritoneal hæmatocele and, secondarily, by rupture, intra-peritoneal hæmatocele; but it is designed to prove that these varieties are not so easily convertible as some authors, as, for instance, Emmet, would have us believe, and that when accumulations of blood occur within the peritoneal cavity, the strong probability is that they result from hemorrhage directly into that cavity. If, now, we grant the existence of tubal pregnancy and consider the bursting of the sac, we can understand how, in at least the vast majority of such cases, the resulting hemorrhage would be intra-peritoneal. And, if we go a step further and consider the demonstrated frequency of inflammatory disease of the Fallopian tubes, the resulting destruction of the endothelium, the consequent facility with which the spermatozoa may pass into the ampulla, the fecundation of the ovum and fixation of the products of conception at that point, we can understand why tubal pregnancy is of much more frequent occurrence than was formerly supposed. We can readily understand, too, how the fanciful classifications of the origin of the blood, which we have quoted, come to be reduced to the one head, viz., "rupture of the lower abdominal or pelvic blood-vessels," and how, in the particular of intra-pelvic hæmatocele, such rupture probably depends, in the majority of instances, upon the existence of tubal pregnancy. I have called attention to Harris' classification because he is one of the ablest writers in America, and because it is teachings such as his that have led the profession away from what later experiences are proving to be one of the most fruitful and, until very recently, one of the most fatal causes of pelvic hæmatocele, and that have, as a consequence, diverted attention from what, in the light of

modern surgery, is the only rational treatment of the condition.

It is fortunate, however, that the other side of this important pathological question has not been entirely neglected. From the time Blundell, in 1830, and Bernutz, in 1848, guessed at the nature of these cases and suggested the expediency of abdominal section for the control of the progressive hemorrhage, there was no one to put the suggestion into practice until Mr. Lawson Tait,<sup>1</sup> in 1881, at the urgent solicitation of Mr. Hallwright, of Birmingham, did the operation. It was the beginning of a new era in the intelligent understanding and management of these hitherto intractable cases. Prior to that time the mortality was almost one hundred per cent.; since that time I have heard of no one losing a case subjected to Mr. Tait's line of treatment, except in one instance, and that was a case in Mr. Tait's own hands. The pathology upon which the treatment was based, and which has been confirmed by the revelations of the treatment itself, has, however, been more generally accepted than has the practice. Schroeder,<sup>2</sup> J. Veit,<sup>3</sup> and Kirrisch<sup>4</sup> are among the leading Germans who agreed with Fritsch,<sup>5</sup> that "the most frequent source of the hemorrhage is the ruptured ovisacs of a tubal or other extra-uterine pregnancy." Among gynecologists, Tait, Imlach, Berry Hart, Thomas, and Emmet are among the most conspicuous who concur in the doctrine, while among the obstetricians, Lusk, Parvin, Barnes, Galiban, and Playfair may be mentioned; indeed, it appears that among those who are the closest students of this question there is practical unanimity that tubal pregnancy is the most common cause of intra-peritoneal hæmatocele, but, as I have intimated, there is less unanimity on the subject of treatment. Why there should be variance on this

<sup>1</sup> Lancet, October 26, 1886; also, Diseases of Ovaries, p. 348.

<sup>2</sup> Handbuch der Krankh. der weibl. Geschlechtsorgane, 7 Aufl. Leipzig, 1886.

<sup>3</sup> Zeitschrift für Geburt und Gynäk., 1884.

<sup>4</sup> Quoted by Lusk: Midwifery, p. 289.

<sup>5</sup> Fritsch: Dis. of Women, p. 289. New York, 1883.

question, when there is practical agreement on the more primary and fundamental one, is not apparent, unless we shall find that different constructions are placed upon those pathological changes which take place subsequent to extravasation. To my mind those changes were described with great fidelity to truth, if not to details, by John Burns, already quoted. There are, however, several points of difference between later writers. Thus Fritsch<sup>1</sup> says: "The blood in the peritoneal cavity does not remain fluid, but coagulates very rapidly." Tait<sup>2</sup> says: "When blood flows in quantity into the peritoneal cavity, probably by reason of its dilution by the lymph always present there and easily excited into excessive flow by any abnormal condition, it does not show much tendency to coagulate save in a very fitful and fragmentary way." This is a starting-point of a further divergence culminating in the matter of treatment. Fritsch says: "The operative treatment of hæmatocele has given very bad results." Tait says of his first twenty cases operated upon, "The recovery has been complete and permanent." If we study the pathological changes subsequent to rupture, we have to take into consideration several elements, viz.: 1, The blood; 2, the foetal structures; 3, the placental tissue; 4, the lacerated tube; 5, the peritoneum. My own experience accords with that of Imlach and Tait, that the blood remains largely liquid; I am, however, so thoroughly convinced of the absorbent power of the peritoneum that I believe it would take up the extravasated blood were it not for one or both of two conditions, viz., continuous hemorrhage and suppuration. But here are precisely the occurrences which interfere with the spontaneous cure of the vast majority of these cases. Interpreted in the light of well-known pathological laws, the changes which take place are as follows, viz.: Suppuration begins with the foetus, which, by being deprived of the environment necessary for its growth, dies;

<sup>1</sup> Op. cit., p. 290.

<sup>2</sup> Lancet, October 30, 1886.

the blood is the next to yield, and the placenta last. If we consider the necessary death of the fœtus, I do not see how we can expect to get along for any considerable time in these cases without having pus; although the failure to find remnants of fœtal tissue in certain instances shows that suppuration may either be deferred until after absorption of the embryo has become more or less complete, or that it has the power to completely disintegrate the, as yet, almost protoplasmic products of conception. The behavior of the peritoneum is different at different stages; thus, immediately after rupture of the tube, the blood and fœtus, like any other foreign bodies or irritants, provoke it to increased vascularity, and there is a temporary transudation of serum; if, however, suppuration does not ensue, the vascularity of the membrane accommodates itself to the new conditions, the serous flow ceases, and the absorbent function begins to be exercised. But let tissue-disintegration begin in the fœtal structures, and, as a consequence, suppuration ensue in the exuded blood, the behavior of the peritoneum is changed at once—vascularity leaps at a bound to inflammatory stasis; a stream of serum is thrown out; cell-proliferation takes place on the surface; plastic lymph is exuded; proximal surfaces become agglutinated, and the suppurative process becomes temporarily limited by a sort of provisional encystment. But we have omitted to speak of the Fallopian tube; what has it been doing? With a rent in its continuity it has been adding to the volume of blood already extravasated, and this addition goes on, because of the lax condition of the tubal walls themselves, because of the non-resistant power of the exuded clot and of the neighboring intestines, and, finally, because of the enlarged condition of the vessel itself. With the volume of blood gradually increasing, with the product of rapid cell-proliferation, and with the increasing volume of exuded serum all added to the temporarily limited mass of suppuration, the pressure is increased, the peritoneal adhesions yield, the pus is brought in contact with a denuded and now



absorbent surface, and septicæmia results; or, suppuration aside and the hemorrhage alone progressive, what other result than ultimate exsanguination can be expected? What wonder that, under the old let-alone régime, the mortality in these cases was almost universal?

With this pathology as the guide, the duty of the surgeon with regard to treatment is, to my mind, obvious. It is merely an application of that general law of surgery which, as formulated by Tait and applied to these cases, is as follows: <sup>1</sup> "For surgical hemorrhage, cut down and tie the bleeding-point; if a big branch of the femoral artery were bleeding, my colleagues who deal with such cases would cut down and tie it. Why should Poupart's ligament be a line of demarcation within which this writ will not run?" Bernutz and Goupiel <sup>2</sup> say: "The indication in such cases is plain—we must stop the hemorrhage." No person, I fancy, who properly realizes the situation in these cases will deny the propriety of the proposition; but it occurs to me that there are other indications than hemorrhage for surgical interference—the damaged tube, the foetal structures, and the placental tissue demand attention. Of the latter two it may be said that, even though they become incapsulated and partially absorbed and the residue remain innocuous, they cannot be considered in a surgical sense other than as foreign bodies, and, as such, constant menaces to the health and life of the patient. The tube of necessity becomes destroyed as an oviduct, and, if left intact, it will only be to figure at a later period as a hæmato-salpinx or a pyo-salpinx, and consequently to ultimately demand extirpation. Not losing sight of the fact that some of these cases do well—*i.e.*, the patients live when left alone—the rule remains, that laparotomy is demanded by four considerations, *viz.*: (1) To control the hemorrhage; (2) to remove the products of conception; (3) to extirpate the tube and, of course, the ovary; and (4) to re-

<sup>1</sup> Lancet, October 30, 1886.

<sup>2</sup> Diseases of Women, p. 202. New Syden. Soc.

move the elements of sepsis. It would be well in this connection to mention certain conditions under which I would question the expediency of removing the appendages. I allude to those cases in which the tube and ovary have become adherent to the adjacent parts (and they are generally in this condition), and in which supuration has already taken place (which is relatively less frequent). To tear the tube and ovary away under such circumstances would be to expose the patient to the dangers of septicæmia by bringing purulent material directly in contact with a raw and absorbent surface. In these cases I would control the hemorrhage by passing a deep ligature through both folds of the broad ligament, precisely as I recommended in my former paper should be done in cases of intractable extra-peritoneal hæmatocele.

For the purpose of illustrating the foregoing principles, I beg leave to call your attention to the following case :

Mrs. H——, aged thirty-nine, became pregnant in March last. She missed twice. Not desiring children, she took an abortifacient of some sort. A few days later she called in a physician to control a metrostaxis. She deceived him as to the exact nature of her case, which now took a different turn. The metrostaxis ceased, but she was seized with violent pains low down in and to the right of the pelvis, and she fainted twice during the day. A few days later she called in Dr. H. E. Twitchell, of Hamilton, to whom she gave a history of recent rigors followed by high temperature. He found a tumor occupying Douglas' cul-de-sac, which he took for the fundus of a retro-displaced uterus. Coupling these physical conditions with the history of abortion, he concluded that the conception was dead, but that, owing to the position of the uterus, it had not been discharged, and that the clearly septic symptoms were of intra-uterine origin. He sent for me to relieve the uterus of its contents. On my arrival, May 6th, I found, in addition to the foregoing physical conditions, diffuse tumefaction in

the pelvis, the cervix well forward under the pubis, a tender and tympanitic belly, and a temperature of  $104^{\circ}$  F. The condition was so like what I have seen in retroflexion of the gravid uterus that I was disposed to accept Dr. Twitchell's diagnosis. The inflammatory symptoms were so great, however, that I concluded to give the patient some opium and quinine, pack the vagina with a tampon of glycerine and tannin, and wait until the next day.

May 7th.—The tenderness had so far subsided that it was deemed expedient to try to evacuate the uterus. The sound introduced as a guide did not, however, turn backward into the supposed retroflexed fundus, but followed the ordinary course three and one-fourth inches. A curette-forceps was now introduced, and numerous shreds of decidua were removed. Bimanual examination now enabled me to make out the womb and the retro-uterine mass as two separate bodies. Around this central fact the whole history of the case now took shape, and a diagnosis of tubal pregnancy, with resulting hæmatocele and abscess, was pronounced. Laparotomy was done the same afternoon, Drs. Twitchell, Skinner, and Fitton present and assisting.

A two-inch incision was made. The peritoneum was found stained with blood, studded all over with patches of exudation-lymph, while all proximal surfaces were agglutinated. On introducing my finger, and passing it toward the cul-de-sac, I found myself breaking up these adhesions, which were but slightly resistant, until presently it appeared to drop into a sort of cavity. Fetid pus, semiliquid blood, shreds of foetal tissue, and placental *débris* now came welling up through the incision. Sponges were introduced to limit the diffusion of this septic material; and an attempt was made to pump out the remainder with aspirator-tube, but failed. I now introduced sponge after sponge, throwing each one away as I removed it, until they came back coated with laminated placental tissue rather than blood or pus. Re-

course was now had to flushing, and pitcherful after pitcherful of water was thrown into the abdomen. Not satisfied with this, I drew out the intestines, carefully mopped them off, returned them, and again flushed. A sponge now removed showed a fresh blood-stain, and I felt that I yet had a bleeding-point to deal with. The tube was, however, firmly adherent, and I felt that to tear it loose would expose its site to infection from some possibly remaining pus. I consequently satisfied myself with ligating through both folds of the broad ligament, leaving the tube within the silk. I again flushed, introduced a drainage-tube, and closed the abdominal incision. The patient was put to bed; her temperature before the operation was  $104.4^{\circ}$  F.; she now had a rigor, which I attributed to shock; after this the temperature again went to  $104^{\circ}$  F., but speedily came down to  $99^{\circ}$ .

The after-treatment consisted in Bantock's method of irrigating the cavity every two hours with a solution of sulphurous acid, beginning with one part in twenty of water, increasing the strength finally to one in five. In the early stages of the case I added twenty-five per cent. of glycerine, my object being to favor the exosmotic action of the tissues and thus render absorption the more improbable. Considerable pus was washed out each time for several days. No opium was given. On the fifth or sixth day, however, the temperature ran up to  $103^{\circ}$ , occasioned, as might have been expected, by the development of an abscess in the primary incision; this, however, was opened by Dr. Twitchell, who obliterated it with a single application of powdered salicylic acid. At the end of the third week drainage was discontinued, the sinus in the abdominal wall being kept open by a pledget of cotton. A few days later the patient had a rigor, and her temperature ran up nearly to  $104^{\circ}$ . Dr. Twitchell promptly reopened the channel with a bullet-probe, and removed a very perceptible quantity of pus from the original sac. The sinus was now further dilated by slippery-elm tents passed the whole length, when a drainage-



tube was reintroduced, and the case treated as before. From this point she made an uninterrupted recovery.

This is but a single contribution to the record of laparotomy for the relief of conditions which, prior to 1881, were almost uniformly fatal. From that time up to the date when Mr. Tait sent the fourth edition of his book to press (1883), he had operated upon twenty cases, with twenty recoveries, while in his "Ingleby Lecture," already quoted, he says: ". . . . between January, 1883, and July, 1886, I operated upon twenty-five cases, saving twenty-four of them, a very striking contrast to the old plan of letting them alone to die." Dr. Francis Imlach, whose brilliant record entitles him to recognition as one of the pioneers in this extension of abdominal surgery, told me, when I was with him recently in Liverpool, that he had done sixteen cases, with sixteen recoveries. I have not had time to examine the serial literature for the further record of this operation, although I believe that in England, Bantock, of London; Greig Smith, of Bristol; and Sinclair, of Manchester, have been identified with it. But take the brief record that I happen to have at hand, and that is presented herewith, and we have sixty-two cases operated upon, with only one death. Where, in the annals of extra-uterine foetation, is a similar record to be found in the let-alone policy?

Let me conclude this paper, which is already too long, with the following summary: (1) Intra-peritoneal hæmatocele is an intra-peritoneal accumulation of blood. (2) Ruptured tubal pregnancy, the most common form of extra-uterine foetation, gives rise to an accumulation of blood within the peritoneum. (3) In consequence of the fluid condition of the extravasated blood and of the yielding character of the adjacent tissues, the hemorrhage has a tendency to continue. (4) In consequence of the death of the foetus, there is developed a marked tendency to suppuration. (5) In consequence of becoming a foreign body, the product of conception, even though it become encysted, is a constant source of danger. (6)

The damaged tube, if left *in situ*, can serve no other than a pathological purpose. (7) Laparotomy is therefore called for to (a) control progressive hemorrhage, (b) to remove dangerous *débris*, (c) to extirpate worthless appendages, and (d) to overcome septic conditions. (8) Extirpation of the appendages should not be practised when adhesions are firm, and free pus exists in the sac. I was taught this lesson some years ago by losing a patient from pyæmia in which the pus, discharged from an infinitesimal cyst which was accidentally ruptured, had been absorbed by the raw surface from which an adherent ovary and tube had been torn. (9) In cases in which the appendages are left, the bleeding, if slight, may be controlled by the styptic influence of the sulphurous-acid irrigations, or, if considerable, by deep ligature of the broad ligament. This is the expedient which I suggested to this Society in a former paper. I had occasion to apply it first for the control of intractable hemorrhage in a case in which I had enucleated a very large intra-ligamentous cyst of the ovary, and I did it last in the case reported in this paper. The observance of these rules will, I believe, result in the highest success of a line of treatment the adoption of which is demanded by the revelations of pathology and the dictates of modern surgery, and the vindication of which is to be found in the brilliant record which it has already scored.



