A Clinical Lecture

ON

EARLY EXTRAUTERINE PREGNANCY.

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GENTLEMEN,—A few years hence some of you will be at the bedside of a woman in the prime of life who is the victim of a physiological tragedy. Pale and collapsed, the young wife—or, maybe, mother—is rapidly dying before your very eyes. All the husband can tell you is that she missed a “period,” which was unusual, a week or two afterwards some irregular bleeding occurred, and abdominal pain suddenly ensued. Yes! she is dying; and you will say to yourself, What is the matter with her? what can be done for her? Gentlemen, there is but one answer, one only. She is bleeding; tie at the bleeding point!

I need not make any apology for bringing before your notice two cases of extrauterine gestation which you have recently seen in the wards. For nearly a thousand years the condition has been known, and healthy women have bled and died. For twenty years the condition has been treated with a success which has no parallel in surgery. Yet there are still men who hope and wait—only to bury. “Do not you think it would be better to wait for further symptoms?” is said; and the next symptoms are the last!

In considering the subject before us, let us go back to the Graafian follicle which impressed us so forcibly when first we studied it in sections of the ovary of a cat. You will remember there was the follicle itself, and within it the tiny egg or ovum. With regard to the former it may be stated, in passing, that the well-known ovarian cyst arises from it by a morbid process. With regard to the contained egg, however, there is a destiny which concerns us. From the unfertilised egg there may arise products suggestive of abortive attempts at development—dermoids, containing teeth, hairs, and the like; and in one case a skeleton was found in a dermoid of the ovary. The fertilised ovum on the other hand, the oöperm, becomes an individual element, having nucleated red blood corpuscles, capable of intrinsic development, and of an existence at first as a dependent embryo and later as an independent child. It is a parasite travelling from the peritoneum to the outer world. If in its journey it can get enough to live upon, it grows and develops, usually spending nine months in the uterine incubation chamber. If it meets with an accident it dies, bleeding takes place in and around it, and it becomes a “mole.”

We may congratulate ourselves that in a primitive condition we made a naturally safe journey, with adequate nourishment on the way, and are now alive to tell the tale. But it is sometimes otherwise, and the destiny of ova is the destiny of men. There may be a hitch on the line, and “extrauterine gestation” then continues at the stopping place. Adequately nourished, the parasitic oöperm grows; starved, it dies. If it grows there comes a time when it bursts its bounds, often causing the death of the host—“ruptured” extrauterine pregnancy. If it dies it may remain as a “mole,” or be absorbed, or be expelled as a tubal “abortion.”

OVARIAN PREGNANCY.

The egg is not of necessity fertilised in the uterus or Fallopian tube, for the spermatozoa can swim against the stream of cilia and wave of peristalsis; and they have been found at the fimbriated extremity of the tube, and in bitches upon the ovary itself. We now know that they have even entered the Graafian follicle of a woman's ovary, because in some cases the oöperm has remained in the ovary and developed into an embryo; and there are about a score of well-authenticated cases to prove this. The recent specimen obtained by Professor Kowser and described by Mdlle. v. Tussenbroek, not only proved the fact of ovarian pregnancy, but, moreover, that the embryo is complete in itself, the syncytium (the cells covering the chorionic villi) included; and that in its entirety it was quite distinct from the surrounding follicle. Other cases

have been recently described by Croft, Gilford, and Anning and Littlewood.

TUBAL PREGNANCY.

With the foregoing exception, the cases of extrauterine gestation with which we have to deal are primarily tubal. Why the ovum becomes engrafted upon the tube is but little little known, and inflammation of the tube is not the potent factor it was formerly supposed to be. Certain it is that in some cases the cause is a mechanical obstruction, such as a myoma, a polypus, or a kink in the tube produced by adhesions. But this will not explain all cases.

Many variations and combinations are possible. Twins have been found in the same tube. Several cases are on record of an extrauterine foetus on one side and the corpus luteum in the ovary of the opposite side, suggesting that external migration of the ovum may be a possible cause of ectopic pregnancy. Occasionally both tubes have been found gravid, of which I have seen an example, the tube of one side containing a mole or dead foetus and the other showing a viable embryo. Over 60 cases are on record in which the extrauterine gestation has been recurrent, in 1 case in the tube previously affected, and in about half that number of cases simultaneous intrauterine and extrauterine pregnancies have been recorded. Pregnancy has even occurred in an ovarian cyst which communicated with the Fallopian tube.

When the ovum is grafted upon the wall of the Fallopian tube the attachment tends to become very intimate; and when by the growth of the foetus, with its containing amniotic sac the parts are unduly stretched and rupture, the chorionic or placental attachments hold on till the last, even to the full term of gestation. If, by accident, the attachment be injured, bleeding takes place and a tubal mole remains, or a tubal abortion takes place into the pelvic peritoneum. The proportion of tubal abortion to tubal rupture is 1 in 4 (Sutton). Pelvic “hæmatocele” is commonly the result of tubal pregnancy. The abdominal ostium remains patent; and, though traces of the foetus or chorion may not be seen on a casual examination, a corpus luteum of pregnancy will be found in the ovary. The blood tumour becomes defined, the bounding clot becomes laminated and vascularised, and it contracts adhesions to surrounding parts, including omentum and intestine. As a result of fresh bleeding, particularly about the time when a “period” would in the ordinary course of events be due or as a result of injury, this first boundary gives way. The patient has sudden abdominal pain, becomes collapsed, remains in bed a few days, and perhaps gradually improves for a time. The fact is that a larger blood tumour has suddenly formed, which again becomes walled in by a soft friable capsule of organising coagulum. It is a blood tumour in connection with a tubal artery, resembling in all respects a circumscribed traumatic aneurysm. It may become diffuse at any time and end fatally; but, like a traumatic aneurysm, it often does so in stages at weekly intervals, or at the time of the monthly hyperæmia.

CASE 1.—Mrs. P., aged 28, a healthy-looking mother of three children, the last five years ago, had for some time pain and tenderness on the left side on coitus, though not severe. Her last period was three weeks ago, two days over time. It lasted fourteen days, and she passed a fair amount of clots, which she had never done previously except on one occasion three years ago. About seventeen days ago she had an acute attack of pain in the hypogastric region. A week later she had another attack of hypogastric pain; and Dr. Barber, with whom I subsequently saw the patient in consultation, found a distinct swelling in the left pouch of Douglas, which was extremely tender. A week ago she had another similar attack of pain—“it made her sweat, it was so bad.” A tense, semi-fluctuating swelling was then detected in the left pouch of Douglas four or five times larger than before. During the illness there were no rigors and no temperature. On examination, the uterus was found extremely depressed, pushed forwards and fixed, and the fundus could not be felt above the pubes. The cervix was large, soft, and the os patulous. On the left side and passing gradually on to the uterus was a large, tense, cystic swelling, which could be felt *per rectum* bulging most distinctly behind and to the left of the uterus. There was a tense cystic sensation, both directly and bimanually to above Poupart's ligament, and no inflammatory thickening around. There was no change in the breasts.

Operation.—Median celiotomy was performed, and there was no free blood in the peritoneal cavity. The body of the uterus was felt enlarged and fixed, and the appendages on the right side matted. The left side of the pouch of Douglas was occupied by a tense tumour filling the whole space, passing imperceptibly on to the uterus, and almost so on to the left iliac fossa. At the extreme left a loop of small intestine was adherent, also a long tag of the omentum which presented old blood staining for three-quarters of an inch at its termination (Figs. 1 and 2). The gut and omentum were liberated and an attempt made to deliver the mass. In doing so it easily burst by a long rent, much old fluid blood escaped, and a quantity of clot was removed by the hand from the shaggy cavity

remaining. The wall of the cavity was by some force and manipulation brought up to the wound, and its broad stump transixed and ligatured in three sections. The ligature nearest the fundus cut through the thick tissue like cheese, and the cut surface bled rather freely: it had to be secured by separate suturing. The redundant capsule was then cut away. The ovary, in the hinder part of the mass removed, contained a large thick-walled corpus luteum of pregnancy with remains of clot therein, and there was an old contracted corpus luteum close by. The Fallopian tube was perfectly intact, unruptured, and not much larger than normal. The ostium was of good size. The fimbriae were exposed in the wall of what remained of a cystic cavity a little beyond them (Fig. 2). The patient made a rapid recovery.

Fig. 1.—Showing the tumour on the left of the uterus (U), with adherent omentum above. (1) Corpus luteum of pregnancy; (2) old corpus luteum.

Fig. 2.—The same seen in section; U, uterus; a, inner cavity; b, outer cavity.

This case appears to have been one of tubal abortion; and you will note this important fact, that at first a small blood cyst must have formed round the ostium of the tube; then this ruptured, and a larger blood cyst formed without it. The staining of the adherent omentum showed that a fresh peritoneal outburst was imminent. Moreover, the case shows that an anterior vaginal operation would not have been suitable, for omentum and small intestine would have remained adherent to the vault of the cavity, which, being composed of vascularised blood clot of a friable nature, was a source of considerable bleeding at the time of operation.

Let us now consider what happens when the ovum contracts a firm attachment to the tube, which suffices later for the nutrition of the embryo through the medium of the placenta. For many of the facts in this connection we are indebted to Mr. J. W. Taylor, whose Ingleby Lectures for 1898 are a singularly clear collection of accurate observations and interpretations. It may be stated that with a living foetus the placenta always remains attached to the tube; where the placenta is, there is the tube, or what remains of it. Where the living foetus is, there is the amnion surrounding it.

The foetus may pass in one of four primary directions: into the pelvis, by direct abortion or by rupture of the outer third of the tube; into the ventral abdomen, by rupture of the tube; into the mesometrium or broad ligament, by gradual giving way of the lower part of the tube; and into the uterus, by passage through the uterine ostium. These are the primary displacements, and, if we add to them the secondary displacements, we get such a table as the following:

	Primary,	Secondary.
1. Ampulla	... tubo-pelvic ... tubo-abdominal	... tubo-abdominal
2. Isthmus	... tubo-pelvic ... tubo-ligamentary	... tubo-abdominal ... retroperitoneal abdominal
3. Interstitial	... tubo-abdominal ... tubo-uterine	... properitoneal abdominal

As I wish you to become impressed with the importance of early tubal pregnancy, we may dismiss those cases of advanced ectopic gestation in which you will have more opportunity of confirming your opinion by prolonged observation and by consultation. But the early cases will demand your own personal skill in detection and responsibility in treatment.

Early tubal pregnancy may be said to comprise cases up to the fourth month, before which time rupture usually takes place. The earlier cases, those during the first six weeks, are characterised by suddenness of onset, often an absence of palpable signs, and gravity of the issue. The rupture commonly takes place at the uterine end of the tube into the peritoneum. It has been known to occur within three weeks of impregnation, and, unrecognised, usually causes death in from eight hours to two days. It is not likely that premonitory signs will have been recognised, for the detection of an early enlarged tube behind the uterus of a healthy female is more a matter of good luck than of good fortune. But there are, as a rule, three prominent facts: A history—that of an unusual delay in menstruation in a married woman, followed by an irregular bleeding of some sort a week or two later; a symptom—that of sudden acute abdominal pain and tenderness, with sickness and collapse; a sign—that of internal hæmorrhage. It may be long since the birth of the last child, or the woman may never have been pregnant before; it has even occurred as the result of a single coitus. But, given the above three facts, the diagnosis becomes almost a certainty. The first two facts speak for themselves; but what is almost pathognomonic is their association with the third fact, that of internal hæmorrhage. This being the chief difficulty, how can we recognise it? Shock is common to it, and a number of other conditions, but the aspect and the pulse are the true clues to progressing anæmia. The pallor of the perfectly conscious patient strikes you at once. The lips, gums, and conjunctivæ are almost as white as the surrounding skin, and there is an absence of the natural blush of the ears and tinge in the cheeks. The finger nails appear white throughout, and after pressing upon them there is no return of colour. Obviously there is sudden anæmia. Now take the cold clammy hand and feel the pulse, which is never full and bounding as in inflammatory affections. The tension is low. The artery expands with a little jump, and as quickly subsides again. Soon the pulse becomes smaller, then running in character, and finally gives an occasional flicker before it ceases to be felt entirely. Take out your watch and quietly count the pulse every ten minutes, and record its rate as it uniformly quickens; and, having in the first place diagnosed sudden anæmia, the pulse-rate is sufficient to tell you that the anæmia is progressing. Given these facts in a married woman whose uterus is not particularly enlarged, they are sufficient to warrant immediate operation—aye! they demand it.

But it is necessary to satisfy oneself of the probable absence of other conditions which may give similar indications. Gastric hæmorrhage and perforated gastric ulcer may simulate the condition very closely. But in the gastric condition the patient is usually a chronic dyspeptic with epigastric pain, and the anæmia is usually a chronic circumstance. I lay stress on this differential diagnosis, because in ruptured extrauterine pregnancy the liver dullness may disappear, as in a case of Mr. Jessop's referred to by Mr. Mayo-Robson, and in one which I have myself seen. Such a sign is apt to give undue importance to the suggestion of possible gastric origin. In peritonitis from perforations of the intestine, in the various forms of colic, in strangulation, and in tumours with twisted pedicles, we have sudden pain and collapse, often with a rapidly increasing pulse rate; but there is an absence of that marked sudden anæmia of certain parts which characterises the fully-conscious patient suffering from internal hæmorrhage. With a small uterus accidental intra-uterine hæmorrhage is out of the question; difficulty can only arise when there are coincident pregnancies in womb and tube.

In later cases—those from six weeks to three or four months—the tendency to severe internal hæmorrhage may not be at first so sudden. There are often stages before the fatal outburst. A new and important factor enables a more certain diagnosis to be arrived at, namely, the presence of a well-marked tumour behind and to one side of the uterus, and the recognition of its nature will enable an early operation to be performed before free hæmorrhage takes place into the abdominal cavity, the signs of which would be those already described. If there be delay from any cause, grave sudden anæmia may ensue at any moment.

CASE II.—I was urgently sent for by Dr. Colman one afternoon to see a patient whom he thought to be suffering from internal hæmorrhage from ectopic pregnancy. She was 35 years of age, had been married five or six years, had no children, but had a miscarriage three or four years ago. She had been perfectly regular till two months ago, when the period did not appear. Three weeks ago she felt a very sudden pain in the stomach when turning out a bedroom; she fainted and went to bed and the pain continued for a week. Two weeks ago she had another attack, but worse. She passed "one clot and very red blood and one piece of flesh." Three days ago she had another attack in the afternoon "with a feeling like wind and fainty and sweaty." The pain has lasted ever since, coming and going severely "like labour pains." The bleeding has continued ever since, "every time the pain comes on it causes the bleeding." To-day there have been three such pains. The urine has been drawn off by catheter the last day or two.

When admitted she was very anæmic. The legs were drawn up. The pulse was 140, of low tension. There was no secretion in the breasts. The uterus was very low, the cervix slightly soft and patulous. Behind the uterus and separable from it posteriorly, and more marked towards the left side, was a soft bulging swelling, slightly tender, and not boggy. It projected conspicuously into the rectum, pushing the uterus forwards, but the fundus was not made out bimanually on account of tenderness. Celiotomy was performed soon after admission, and a large quantity of liquid blood escaped with some clots from the abdominal cavity. The left side of the pelvis was roofed over and contained a subglobular swelling which was broken down with the hand, and a three to three and a-half months fetus extracted with the cord and placenta. The fetus was about 4 inches long. The sac was a very thick one indeed, and a temporary clamp was put on its wide expanded stump, while the numerous clots were removed; but the abdomen was not washed out. On subsequent examination of the pedicle, though seen on the left side, it was found to be attached to the right side of the uterus, passing behind and above it. It had two sections, which were separately ligatured with Staffordshire knots; the upper containing ovarian vessels of considerable size descending from above, and the lower passing directly from the uterine fundus. The left ovary and tube formed part of the wall of the sac; the tube, slightly distended and convoluted, formed a hydrosalpinx over the ovary. These were left behind, the ovary feeling large and shaggy from involvement in the wall of the sac. The patient became pulseless during the operation, which was rapidly performed. She was transfused under the left breast, a large jugful of saline fluid was injected into the rectum, mxxxv of strychnine were injected hypodermically, and before she left the operation theatre the pulse had become again perceptible. In the evening the pulse was 160; next day it was 140. The patient left convalescent at the end of five weeks, having been delayed by an attack of left lobar pneumonia commencing at the end of the first week, for which Dr. Shaw kindly saw the patient with me.

The conditions are represented in Fig. 3. The advantages of giving large injections of strychnine in shock of all kinds is now well known, and has been emphasised by the surgeons of Leeds in particular. I was impressed some years ago of its value by an accidental overdose of two syringefuls in mistake for ether to a dying patient. You will observe (Fig. 3)

[Fig. 3.—Tubal gestation, with rupture; U, uterus; R, right pregnant tube; L, left tube (hydrosalpinx); x x, sites of ligation.]

that the pregnant right tube must have passed across to the left side and become fixed there. It was not a case of fertilisation through the left tube, because it was a closed hydrosalpinx. To such a transposition of a pregnant tube there is a distinct tendency. Had the bleeding not taken place, and

the placental attachment had remained secure, the fetus might have escaped into the abdomen in its membranes and lived to term as a tubo-abdominal pregnancy—a condition in which Taylor has demonstrated the persistence of a very attenuated amniotic sac around the child.

Now in a case such as this of later rupture of the pregnant tube, we have the characteristics of the early rupture with the addition of the presence of a tumour. Therefore, given those characteristics, we have only to clinch the diagnosis by our judgment of the nature of the tumour, felt distinct from a uterus not enlarged to a marked extent. It would be unwise to pass a uterine sound in such a case. If the parts are too tender for a satisfactory examination, it would be wiser to examine under an anæsthetic with all gentleness, lest a tube be ruptured by the force used. The fundus of the uterus should be distinctly mapped out at the onset, and an estimate formed of the size of the womb. Then we have to determine the exact state of the vaginal vault to the touch, and lastly, the state of the lower abdomen above the pubes.

Now in inflammatory states of the broad ligament, besides the probable history of recent labour or miscarriage, the vaginal vault has a very characteristic feel. I have seen tubal pregnancy mistaken for pelvic cellulitis. In this condition the depressed vaginal vault has a "boggy" feel—it can be indented with the finger, and a subsequent hollow remains for a time. Moreover, the swelling gradually shelves off from the uterus itself. If, with the finger in the vagina, an attempt be made to shift the mucous membrane laterally over the deeper parts, it will be found to be impossible, owing to the inflammatory infiltration. In tubal pregnancy, and in extra-uterine tumours, the finger can usually be inserted into an angle between uterus and tumour. In cystic collections there is usually an elastic feel, not a boggy feel. In an ovarian cyst the elasticity is firm; in the case of a blood tumour of tubal pregnancy it is softer and less circumscribed in character. In these cases also, a careful examination of the fornix with the finger reveals that the mucous membrane is laterally movable over the deeper parts from absence of inflammatory infiltration.

Another point of interest is that in large vascular tumours and in tubal pregnancy a well-marked pulsating isolated vessel can be felt crossing the vaginal vault transversely on that side. Many conditions such as a myoma or a pyosalpinx will have a corresponding history. An ovarian cyst with a twisted pedicle closely simulates a pregnant tube which is giving way; less the signs of rapidly-progressing anæmia and perhaps increasing size of the tumour. If we now turn to the condition above the pubes we shall often find a lateral dullness there, gradually increasing in extent. It may give way to a resonant note on deeper percussion, and, as Mayo Robson has pointed out, on turning the patient on her side the dullness slowly gives place to resonance. But as I have found this last sign present in the case of an adherent ovarian cyst with twisted pedicle, it is probably not to be relied on. With marked sudden anæmia the diagnosis of tubal pregnancy becomes much simplified.

Having diagnosed early extrauterine pregnancy, what are you to do? Are you to wait with folded arms till the flood gates are opened and the abdomen is deluged with blood? Or in the vain hopes of a successful operation for a possible abdominal pregnancy with a healthy child? For suppuration of the sac? For chronic invalidism? For the discharge of foetal bones by the bladder, as has occurred in over a dozen cases? When surgery can now save over 95 per cent. of cases there can be only one possible answer. Adding the statistics of several large groups of operations together, I find that of 279 cases operated upon, 269 recovered and 10 died—a mortality of 3.6 per cent. Clearly, operation for tubal pregnancy is as safe as delay is dangerous, and to diagnose tubal pregnancy is a just demand for that treatment which gives the patient the best possible chances—early operation. And if the diagnosis of ruptured tubal pregnancy be doubtful, a very small exploratory incision will be sufficient to make it certain. Indeed, the peritoneum may not have to be opened of necessity, for any blood beneath it is usually apparent through it.

AN old law to punish boys under 15 years of age who are caught smoking cigarettes or tobacco in any form is to be revived and again enforced in Cincinnati.