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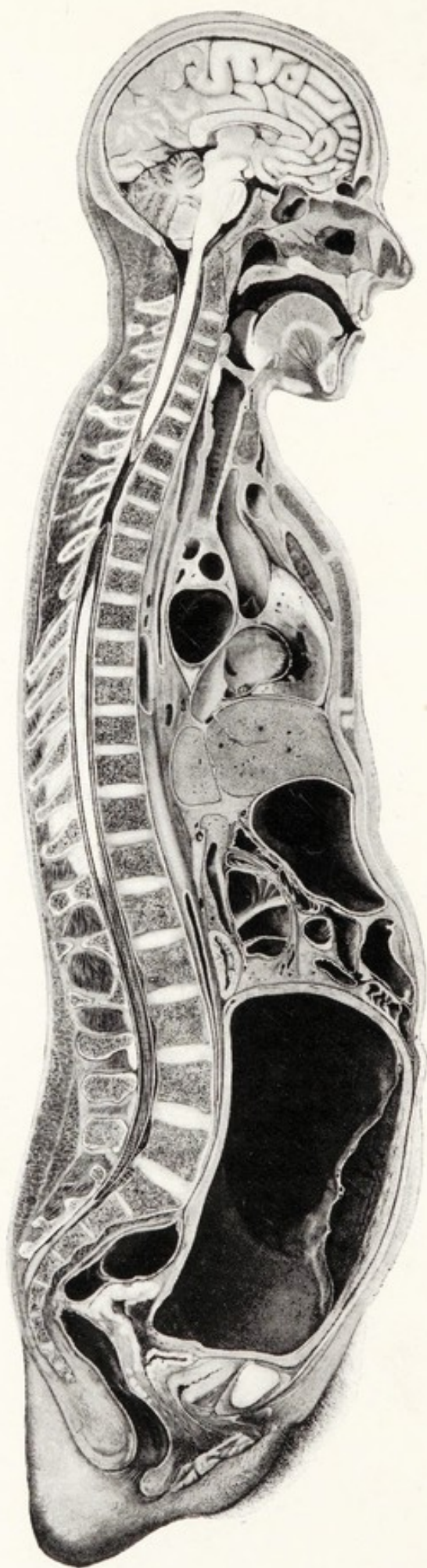




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Section of Body of Case 3, p. 59.



# TUMOURS COMPLICATING PREGNANCY, LABOUR, AND THE PUERPERIUM

BEING THE

LETT SOMIAN LECTURES

DELIVERED BEFORE

THE MEDICAL SOCIETY OF LONDON

*February and March, 1920*

BY

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## PREFACE.

THE lectures, with the addition of the frontispiece, are published as delivered before the Medical Society of London.

I am indebted to the Council of that Society for permission to publish them before they appear in the Society's 'Transactions,' and to the Royal Society of Medicine for permission to re-publish three of the drawings of Carcinoma.

The diagrams of fibroids are photographic reproductions of tracings on glass of the tumours as felt on examination. The microscopic drawings were made by Mr. Ford.

I have to thank Mr. T. W. P. Lawrence for making the section of the body, of which the frontispiece is a photographic (seven-inch) reproduction of the full size (thirty-six-inch) drawing by Mr. Shiells.

HERBERT R. SPENCER.

*March, 1920.*





# LETTSOMIAN LECTURES: TUMOURS COMPLICATING PREGNANCY, LABOUR, AND THE PUERPERIUM,

By HERBERT R. SPENCER, M.D., B.S., F.R.C.P.

## LECTURE I.

### *Fibroid Tumour complicating Pregnancy, Labour, and the Puerperium.*

MR. PRESIDENT,—My first duty is to thank you and the Council of the Medical Society of London for the honour you have conferred upon me by inviting me to give the Lettsomian Lectures.

You, Sir, are following to-night the example of our great Founder in having near you an obstetric physician, for in the picture which adorns our walls, seated near Lettsom, is seen the figure of Charles Combe, obstetric physician to the British Lying-in Hospital. Combe was a great scholar and published one of the finest editions of the works of Horace. When I have wanted a Horatian tag to "point a moral or adorn a tale" I have been wont to consult the index locupletissimus of Combe's Horace, and in order that the Fellows of the Medical Society may have the same opportunity of showing their acquaintance with Horace, I present to the Library a copy of the 1792 edition of his work. Combe was also a great collector of coins, another advantage he had over the present lecturer, who has to be content with "notes."

It is a curious coincidence that the first Lettsomian Lecture on an obstetric subject was given 66 years ago by Prof. E. W. Murphy, a predecessor of mine in the chair of Obstetric Medicine at University College, on education in the practice of midwifery, a subject which is arousing such lively interest to-day.

My only contribution to the 'Transactions' of the Society is a paper advocating the performance of ovariectomy by obstetric physicians, read 26 years ago. It is time to make another communication, and perhaps a record of my experience, extending over 32 years, of tumours complicating pregnancy, labour, and the puerperium may not be without interest to the Society. I have limited



the subject to fibroid tumour of the uterus, ovarian tumour, and cancer of the uterus ; of the last two I have given the whole of my cases, of fibroid tumour all the fatal cases and all the abdominal sections.

CASE 1.—The first of my cases of fibroids complicating pregnancy was a primipara, aged 35, seen in consultation in February, 1888. She had been married eight months, and was about six months pregnant. She had a contracted pelvis, conjugata vera  $3\frac{1}{8}$  inch. Several uterine fibroids were present : one on the left side of the body as big as a large watch, and another as big as a hen's egg on the left side of the lower segment, movable on a thick pedicle, and coming down into the pelvis as low as the vaginal fornix. I advised induction of labour at the seventh month. This was attempted by means of bougies, laminaria and sponge tents and Barnes's bags ; but, owing to the rigidity and small size of the cervix, without any effect. Finally, the cervix was dilated under chloroform with Barnes's bags, and the child turned ; craniotomy had to be performed on the after coming head. The labour was a very difficult one, the patient being under chloroform for three hours.

After delivery, the uterus was found to have a large irregular mass of fibroids on the right side running nearly the whole length of the organ and causing it to reach, when involution was complete, within  $\frac{1}{2}$  inch of the umbilicus.

The puerperium was perfectly normal, without any rise of temperature or pulse.

I advised her if she became pregnant again to come and have Cæsarean section performed. She did not return ; but I was informed that she had several abortions procured in subsequent pregnancies.

Every obstetric physician in his private practice meets with many cases of small sessile subperitoneal fibroids of the size of a walnut to a lemon, as he attends an unusual number of elderly primiparæ in whom they are very common. In primiparæ of 35 and upwards I usually expect to find one or more fibroids, and am not often disappointed. I once had three such private patients lying-in at the same time. These small tumours ordinarily cause no trouble of any kind. I append brief notes of the last case attended.

CASE 2.—H., aged 38, married five years (children 0, abortion 0), 6 feet 1 inch in height, in perfect health. A fibroid as big as a thick watch was found on the left side of the lower segment, and several small fibroids of the size of marbles and walnuts at the top of the fundus on each side. Labour at term, October 11th, 1919, lasted  $8\frac{1}{2}$  hours ; pains normal ; delivery natural ; no *post-partum* hæmorrhage. Child strong,  $9\frac{1}{4}$  lb. Puerperium afebrile. The patient has not been informed of the existence of the tumours.



The next two cases were similar ones from hospital practice :—

CASE 3.—H. W., aged 33 (child 1, June, 1914), was admitted to U.C.H., July 24th, 1905. At the previous confinement a piece of placenta was retained and the patient was curetted, the temperature rose to  $105.8^{\circ}$ , and the patient had an attack of puerperal toxæmia.

On her admission, a small pedunculated sub-peritoneal myoma was found projecting from the surface of the uterus at the level of the umbilicus. The labour, on August 12th, was quite normal, and resulted in the birth of a living child, weighing 8 lb. 12½ oz. Mother and child left the hospital quite well on August 30th.

CASE 4.—H. Y., aged 36, married 12 years, primigravida, was admitted to U.C.H. on February 11th, 1910, at term; the last menstruation had occurred May 6th to 8th, 1909. She had been examined during early pregnancy, when a fibroid was found attached to the right side. The tumour was now somewhat flattened, but was easily felt on the right side of the fundus, which reached nearly to the ensiform cartilage. Labour occurred on March 1st, 298 days from the last menstruation, and was terminated by forceps after 24 hours, owing to delay in the second stage. The child weighed 8 lb. 10 oz., and thrived. There was no *post-partum* hæmorrhage. The temperature reached  $100^{\circ}$  on the day of delivery (the perineum had been torn into the rectum), and again reached  $100^{\circ}$  on the eighth day, otherwise only twice rose above  $99^{\circ}$  ( $99.2^{\circ}$  and  $99.4^{\circ}$ ) on the fifth and sixth days. On March 18th the uterus was still large and bulky, owing to the fibroid; the mother and child were quite well when they left the hospital.

Even when large tumours are present it is remarkable how often patients pass through pregnancy and labour without serious trouble, as the following eight cases show :—

CASE 5.—C. R., aged 44, married (children 0, abortion 0), was admitted to U.C.H. on May 8th, 1897. *She had been married for 21 years but had never been pregnant.* She had always been regular till two years ago, when the periods became more frequent (two to three weeks interval). She did not lose too much. She had not menstruated for four months, but had had a slight white discharge.

On admission there was a tumour in the abdomen of the size of the uterus at 6½ months, reaching up 2½ inches above the umbilicus. It was harder than the normal uterus, measuring 8½ inches across. It varied in consistence; on the right side it fluctuated, and gave a loud souffle and a thrill; on the left side it was hard, the hardness being evidently due to a fibroid tumour as large as a child's head set in the wall of the uterus. No souffle was audible on the left side.

The cervix was high up, behind it was a thin collar of fibroids.

Figs. 1 and 2 show the conditions found on abdominal examination on May 12th and July 22nd.

On May 28th the uterus was 7¾ inches above the pubes; ballottement on the right side was obtained for the first time; the child presented by the breech.

June 10th. Uterus 8¾ inches above the pubes. The larger fibroid tumour measured 5½ inches in diameter.

June 19th. Tumour rather smaller than it was.

June 21st. Foetal heart sounds heard. There appeared to be no

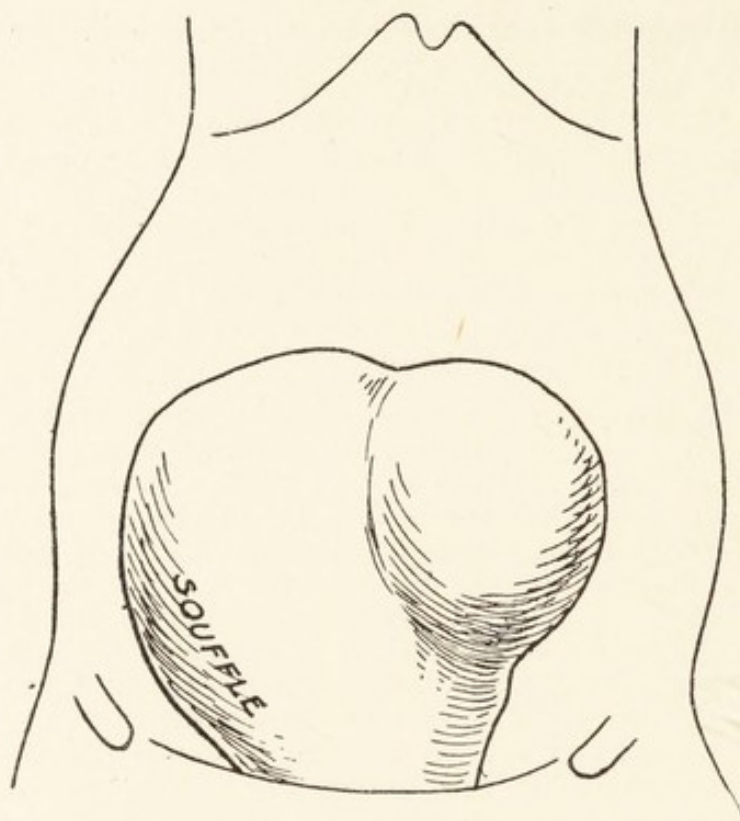


FIG. 1.—Case 5 on May 12th.

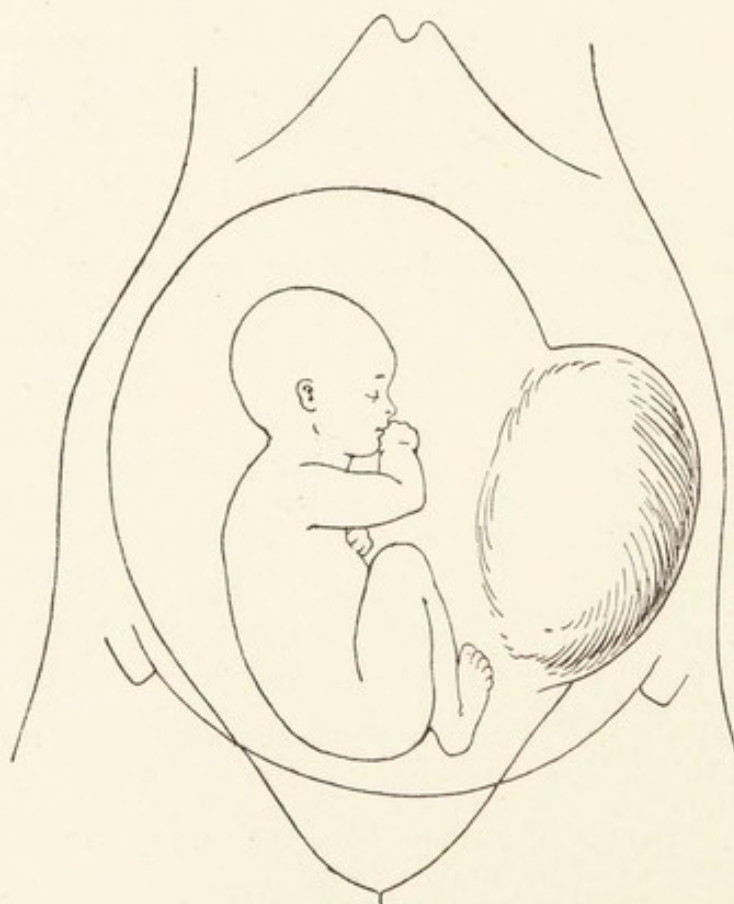


FIG. 2.—Case 5 on July 22nd.

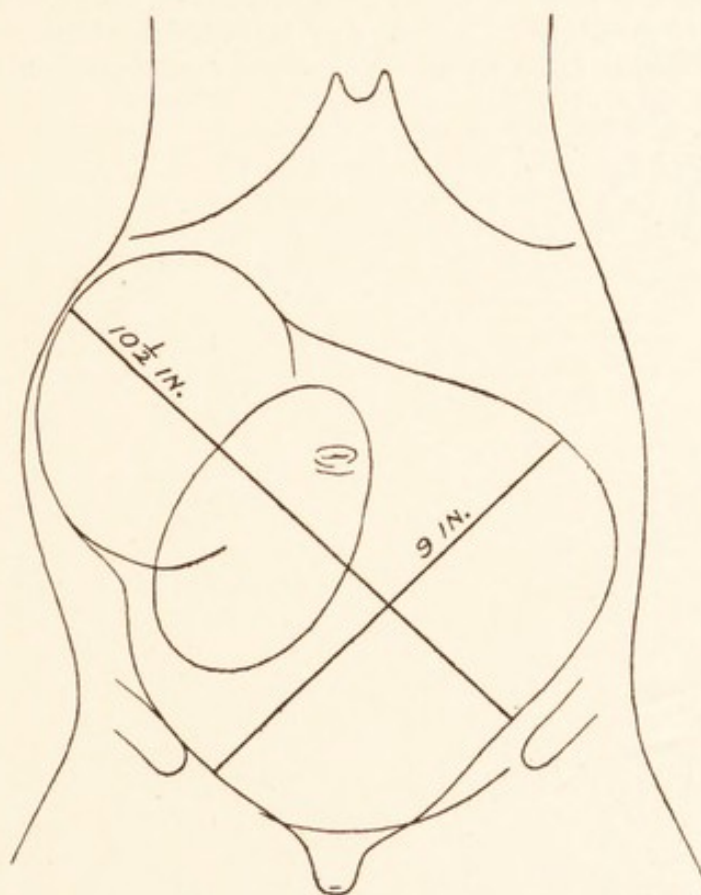


other fibroid than that on the left side of the body. Child presenting by the breech.

The patient left the hospital and was delivered naturally at home of a living male child, which lived for seven weeks. She wrote in June, 1898, that the tumour no longer gave trouble.

CASE 6.—T., aged 42, married eight years, never previously pregnant. Was sent to me by Dr. Pearce of Ripley on April 26th, 1905. She had complained of pain in the right side of the abdomen for the last two months. She was nearly five months pregnant, having last menstruated at the end of November. Menstruation had commenced at the age of 15, was always regular every four weeks, lasting three days, and being preceded usually by pain.

The uterus was much larger than it should be, owing to a fibroid about as big as a foetal head and a larger one as big as a cocoa-nut in the right cornu (see Fig. 3).



T. NEARLY 5 MONTHS PREGNANT

FIG. 3.—Case 6, showing two large fibroids.

The child (a girl) was delivered alive (a breech presentation) by Dr. Pearce on October 2nd, 1905. The mother made an excellent recovery. The uterus contained such a large mass of fibroids that on the 14th day of the puerperium it measured  $10\frac{1}{2}$  inches transversely and reached up for  $1\frac{1}{2}$  inches above the umbilicus.



Fourteen years later, on November 18th, 1919, mother and child were very fit and well in every respect; the child well developed and plump. The mother had not been pregnant again. Menstruation continued to be regular till 1911. Since then (when she was 50 years of age) she had "seen nothing."

On examination, the uterus was small and atrophied, freely movable, and, except a slight irregularity of its surface, no sign of the fibroids could be found.

CASE 7.—On September 26th, 1894, M., a nullipara, aged 37, was sent to me by Dr. Lennox Wainwright, of Folkestone. She had been married twice, the first time at the age of 20, but although married many years to her first husband, no coitus had occurred. Her second marriage took place July 1st, 1894. A few days afterwards she had a period, but had seen nothing since. In the last three days she had been sick, and for three weeks she had had frequency of micturition. At the age of 14 she had an attack of peritonitis, which was repeated in 1886 and 1892, and since then had had several threatenings, and a well-marked attack three weeks ago.

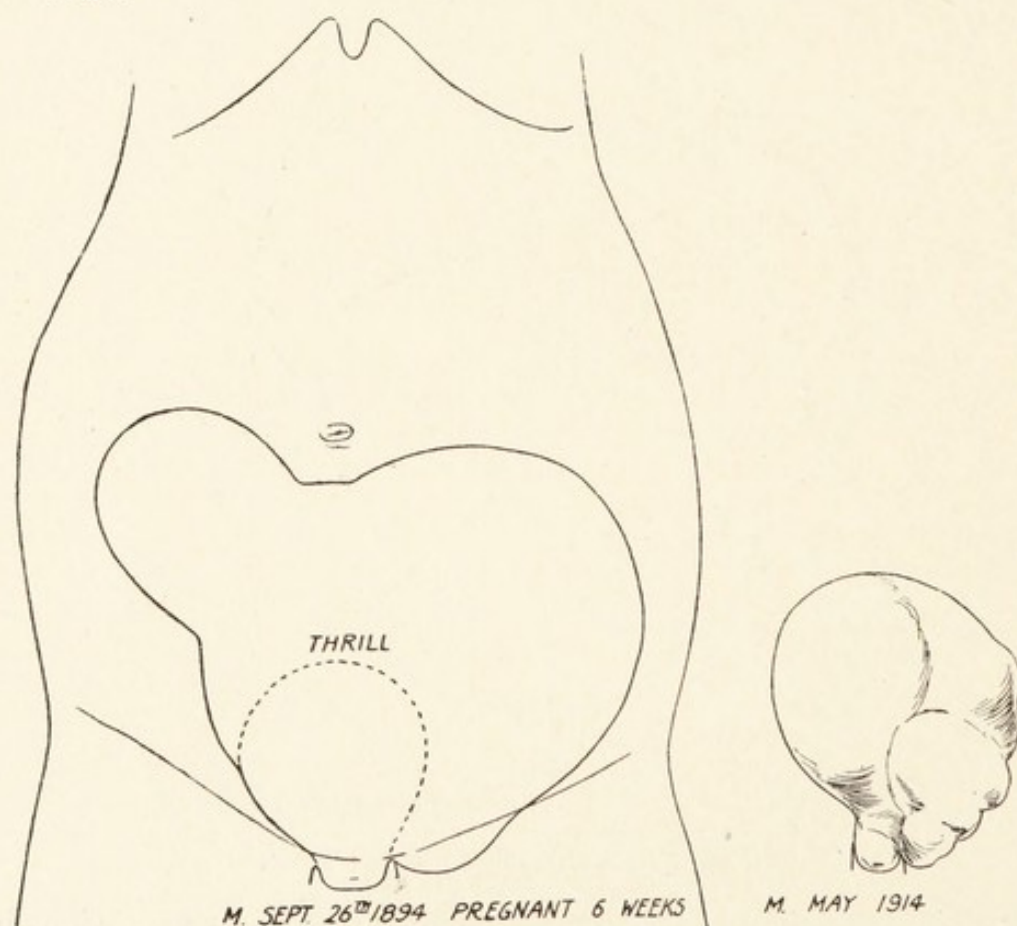


FIG. 4.—Case 7. The larger figure shows the size of the tumours at the sixth week of pregnancy: the smaller figure shows the size of the uterus 20 years later.

Menstruation began at the age of 11, and was regular except at the age of 19, when it stopped for 13 months; it was always very painful.



On examination the abdomen was tender and distended by a tumour, which reached up to the umbilicus on the left side and rather higher on the right, where there was a marked movable projection as big as a fist.

The tumour felt like a myoma and near the middle of it there was a marked thrill.

The uterus was retroverted, apparently enlarged, and seemed to pass into a hard mass above and around the cervix. To the left of the cervix projected a solid mass connected with the uterus. This mass came down to the level of the edge of the cervix. The diagnosis was made of pregnancy of two to two-and-a-half months, complicated with multiple fibroids.

With rest the patient progressed fairly well, but a month later, on October 28th, 1894, I was called to Folkestone to see her, and found her extremely ill, vomiting frequently and obstinately constipated. A large enema of soap and water was administered, with the result that motions were passed and the patient recovered completely. At this time the fundus had risen out of the pelvis, but the fibroid on the left side still occupied the brim. At the beginning of April, 1895, the patient came up to London to a nursing home, with a view to having Cæsarean section performed. The urine was found to contain a large quantity of albumen. The head was above the brim and the lower end of the large fibroid just entered the pelvic brim on the left side, otherwise the pelvis was free and of full dimensions. I had the advantage of a consultation with Sir John Williams and it was decided to induce labour on account of the albuminuria. This was done with bougies. During the labour the fibroid on the left side retracted above the brim and a well-developed girl of about 8½ months' development was born alive, after a normal labour, on April 7th, 1895. This girl grew up a very well developed woman and married in 1914.

On May 7th, 1914, I saw the mother, aged 57, in good health. Menstruation stopped at the age of 47. The uterus was of the size of a fist, hard, and of the shape shown in the diagram (see Fig. 4).

CASE 8.—T., aged 26, consulted me in 1893 on account of some dysmenorrhea, which had come on during the last three years. The pain occurred a week before and during the whole of the period, which used to last eight days and lately six days. The uterus was small, the body a little irregular on the right side, owing to the presence of a small fibroid. There was a body twice the size of an ovary on the left side; this was evidently the large fibroid found later (see Fig. 5). The right side of the lower segment also felt hard, as if from the presence of a small fibroid. A systolic murmur was present at the apex of the heart.

After she had been married 3½ years she was sent to me by Dr. Lyle, of Ealing, on June 12th, 1899. Although only three months pregnant (for the first time) the uterus reached up to a height of 6½ inches above the pubes, owing to the presence of three fibroid tumours, the largest of which was nearly as big as a child's head, the smallest encroaching upon the brim on the right side (see Fig. 5).

She was delivered by Dr. Lyle of a living child on January 12th, 1900, 297 days after the last day of the last period, and recovered well.

She was again delivered, with low forceps, of a living child, which weighed 9 lb. 7 oz., on December 28th, 1903, 287 days after the last period. The labour lasted 5¾ hours.

Twenty-six years after I had first seen her, on November 5th, 1919, I heard from Dr. Lyle that Mrs. T. was well and that the two children were alive and "excellent specimens."



She had begun to menstruate at the age of 14 and still menstruated (at the age of 52). She had only been pregnant on the two occasions mentioned.

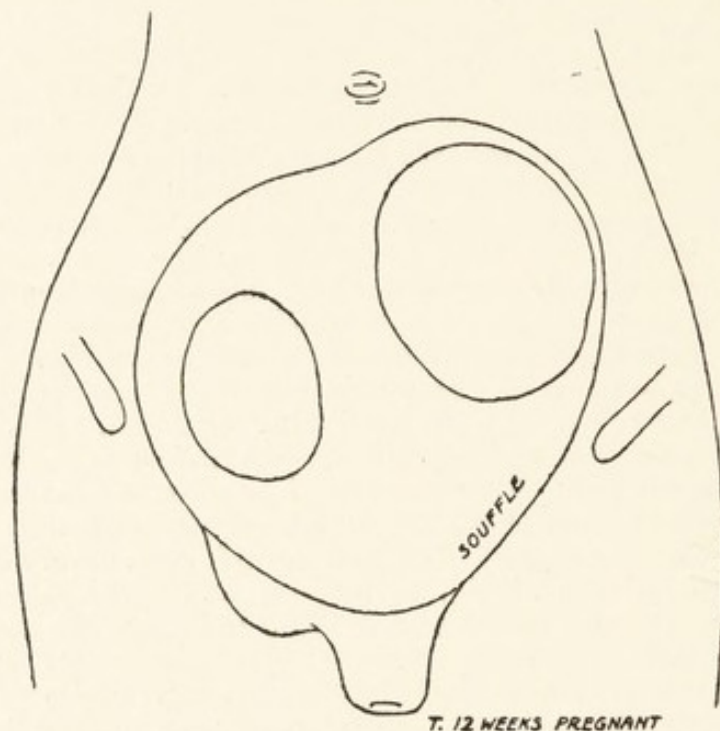


FIG. 5.—Case 8, 12 weeks pregnant.

CASE 9.—A. S., aged 32, married, was admitted at hospital March 14th, 1903.

Menstruation was usually regular, but it ceased on August 12th. On the day of admission some water escaped from the vagina. The uterus felt firm, owing to the escape of *liquor amnii*, and reached up to the tip of the ensiform cartilage. The abdomen was very prominent in the

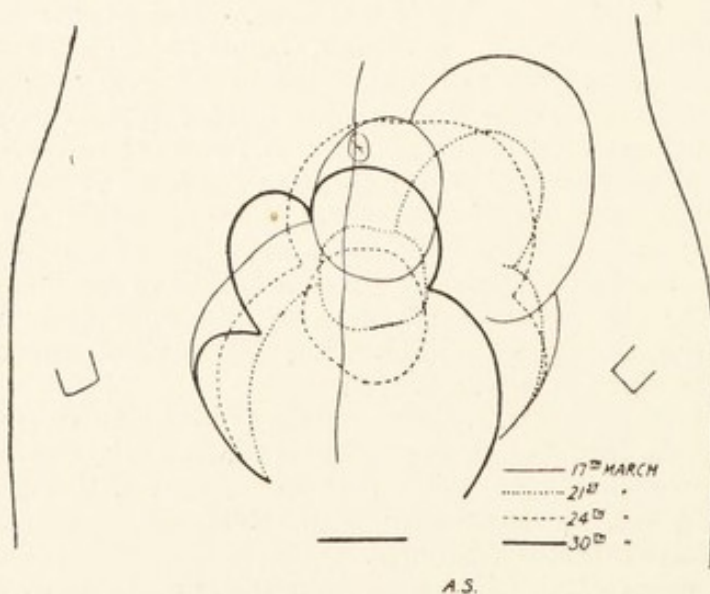


FIG. 6.—Case 9, showing the alteration in size and shape of the uterus and tumours during involution.

umbilical region, where there was a subperitoneal tumour as big as a foetal head, and on the right side between the anterior superior iliac spine and the umbilicus was a second subperitoneal tumour as big as a hen's egg. The cervix was open sufficiently to admit the finger, but formed a thick-walled canal  $\frac{1}{2}$  inch in length.

On March 16th Bossi's dilator was employed for 22 minutes to dilate the cervical canal, and the forceps was applied to deliver. The child, which weighed 3 lb. 18 oz., only lived for half an hour. The cervix was torn extensively up to the vaginal wall; but the patient made a good recovery, the highest temperature being 99.6°. Fig. 6 shows the alteration in size and shape of the uterus and tumours during involution.

CASE 10.—A. C., a primigravida of 29, married five years, was admitted to U.C.H. in the 18th week of pregnancy, her last period having ended on March 9th. There was a fibroid 3 inches in diameter in the lower segment and several smaller ones in the upper part of the body (see Fig. 7).

She was re-admitted at the 36th week on November 7th, 1910, when spontaneous labour occurred, lasted 9½ hours, and resulted in the birth of a living child weighing 5 lb. 2 oz. Mother and child left the hospital well on December 3rd, 1910. The puerperium was normal, the highest temperature being 100° on the third day. The size and shape of the uterus during pregnancy and after delivery are shown in Figs. 7 and 8.

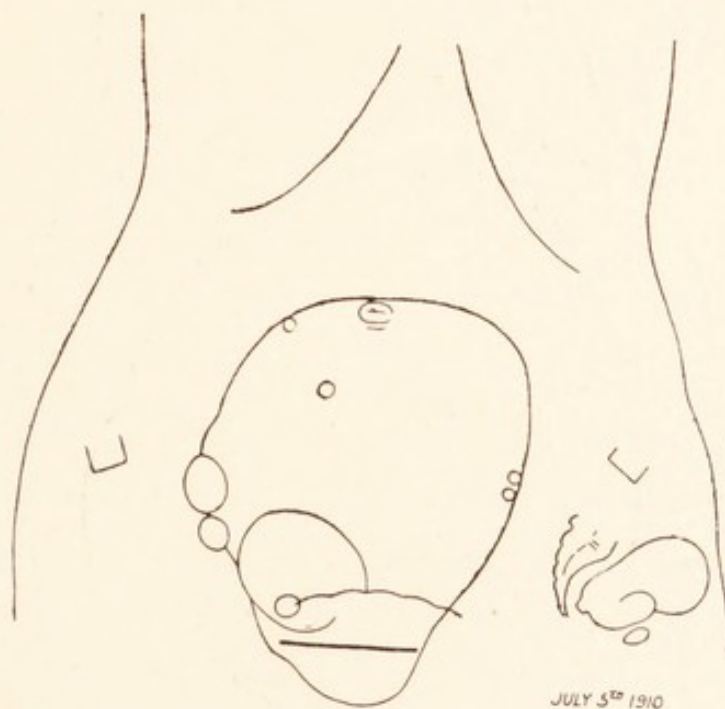


FIG. 7.—Case 10, 18 weeks pregnant, showing several small tumours and a large one in front of the lower segment: shown in sagittal section in the small sketch on left thigh.

CASE 11.—H., aged 41, nullipara, was sent to me by Mr. Swift on January 26th, 1906.

Menstruation had begun at the age of 12, was always regular and profuse, lasting six days and being very painful. The last period had been on October 27th. The pelvis was normal. Although only three months pregnant the upper limit of the uterus was 4½ inches above the pubes and there was a fibroid nearly as big as a baby's head on the left side of the



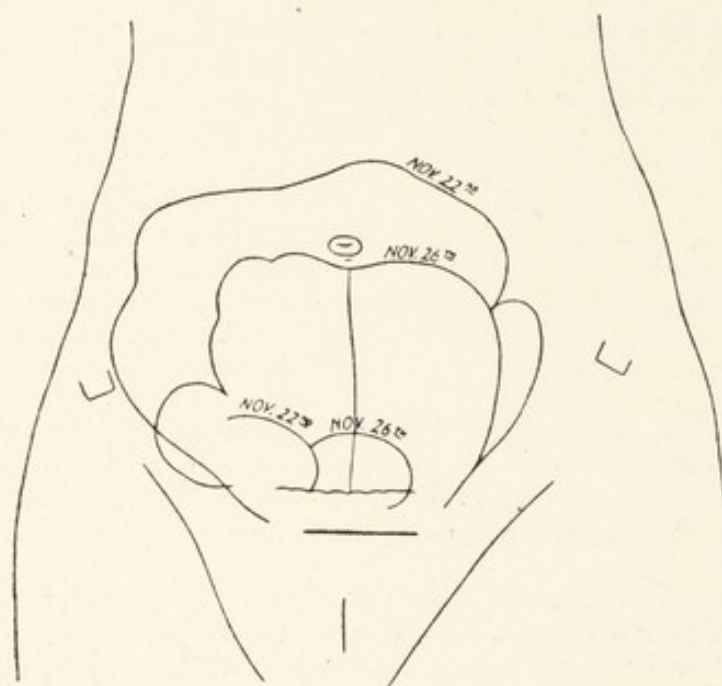


FIG. 8.—Case 10, showing involution of uterus after delivery.

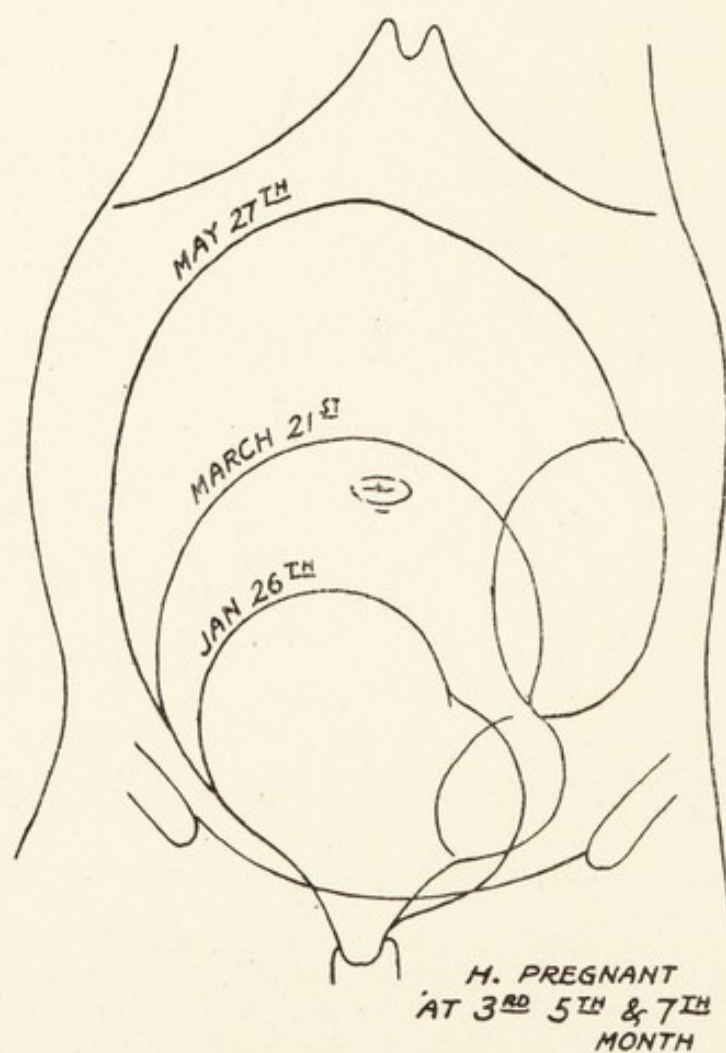


FIG. 9.—Case 11, showing alteration in position and size of tumours during pregnancy





FIG. 10.—Case 12, showing tumour larger than an adult head on right side of fundus; excessive pigmentation of abdominal wall and areolæ.

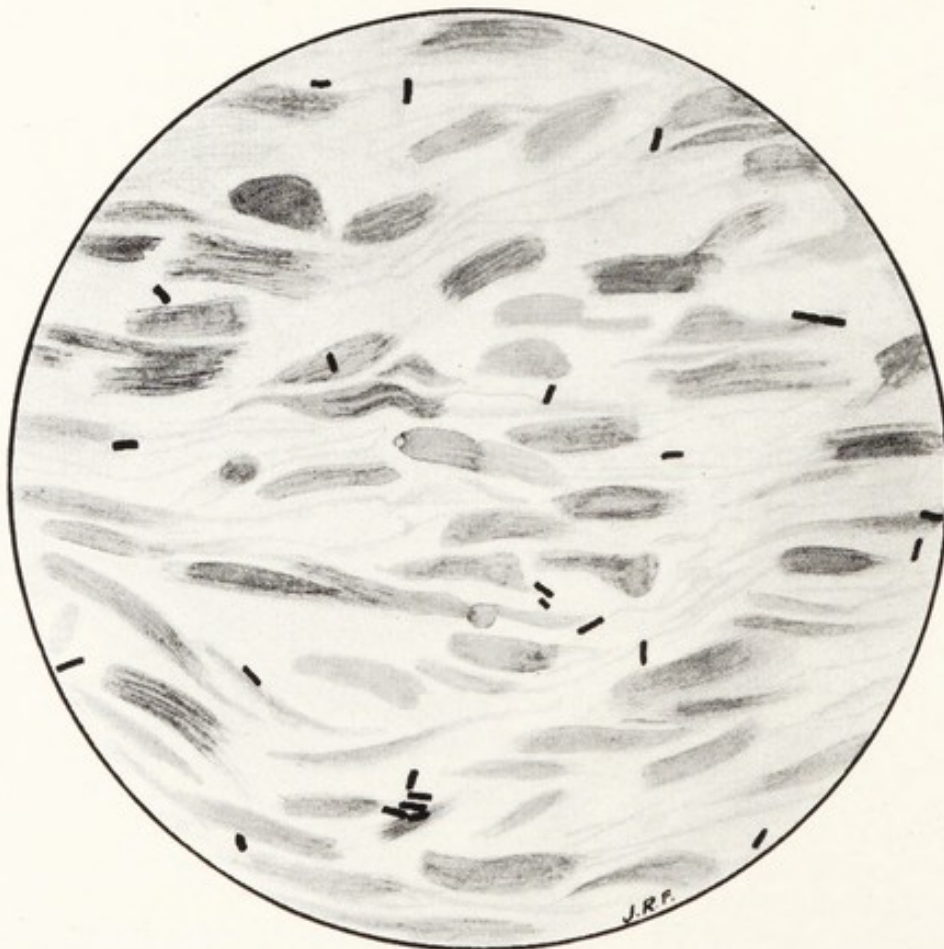


FIG. 15.—Case 30, showing *bacillus Welchii* in fibroid; hypertrophied muscle cells separated and staining badly.



lower segment which encroached upon the brim. The fibroid apparently diminished in size in the next two months and was drawn up into the abdomen. Two months later it was raised to the middle of the left side of the body and had increased in size (see Fig. 9). I attended her in her confinement which was quite normal, resulting in the birth of a living child on August 1st, 1906. The puerperium was normal; the myoma slightly diminished in size. The patient was in good health in January, 1920.

CASE 12.—S. H., a nullipara, aged 36, had a large tumour in the upper right wall of the uterus (see photograph, Fig. 10, taken on December 11th, and Fig. 11). She had as lightly contracted pelvis, the diagonal conjugata being  $4\frac{1}{2}$  inches. On this account labour was induced by bougies and the patient was delivered naturally of a child weighing 8 lb.  $1\frac{3}{4}$  oz., on December 15th. Both mother and child recovered. The involution of the fibroid is shown in the table.

*Table showing the Involution of the Uterus and Fibroid.*

Labour Dec. 15th, 1895.	Height of tumour above pubes.	Height of fundus above pubes.	Tumour.	
			Long axis.	Short axis.
Dec. 16th ...	$11\frac{1}{2}$	$4\frac{3}{4}$	$9\frac{1}{4}$	$6\frac{1}{4}$
" 17th ...	$10\frac{1}{2}$	4	$9\frac{1}{4}$	$6\frac{1}{8}$
" 18th ...	$11\frac{3}{4}$	$4\frac{3}{4}$	$9\frac{1}{4}$	6
" 19th ...	$11\frac{1}{4}$	$3\frac{1}{2}$	9	$5\frac{1}{2}$
" 20th ...	$11\frac{1}{4}$	$3\frac{1}{4}$	9	$5\frac{1}{2}$
" 21st ...	9	$3\frac{1}{4}$	$8\frac{3}{4}$	$5\frac{1}{8}$
" 22nd ...	$8\frac{1}{2}$	$3\frac{3}{8}$	$8\frac{3}{4}$	$5\frac{3}{4}$
" 23rd ...	$8\frac{1}{2}$	$2\frac{3}{4}$	$9\frac{1}{4}$	$5\frac{1}{2}$
" 24th ...	$8\frac{1}{2}$	$2\frac{3}{4}$	$8\frac{1}{2}$	6
" 25th ...	8	$2\frac{1}{4}$	$8\frac{1}{4}$	6
" 26th ...	8	$1\frac{3}{4}$ ?	$8\frac{1}{2}$	$6\frac{1}{2}$
" 27th ...	$8\frac{1}{2}$	?	$9\frac{1}{2}$	$6\frac{1}{2}$
" 28th ...	8	?	$8\frac{1}{2}$	$5\frac{1}{2}$
" 29th ...	$8\frac{1}{2}$	?	$8\frac{1}{4}$	6

CASE 13 (Table A, No. 5).—A. I., aged 29, married one year, pregnant for the first time, was admitted to U.C.H. At the third month of pregnancy she was operated on for supposed twisted ovarian tumour on September 18th, 1909, by Dr. Gray, who finding it was a sessile fibroid closed the abdomen without interfering with the tumour. On February 8th the tumour felt hard and flatter than it had been before the operation.

On February 12th it was  $3\frac{1}{2}$  inches in diameter, hard and free from tenderness. Labour started at 37 weeks 5 days from last menstruation (June 8th, 1909).

A premature child 4 lb. 10 oz. was delivered naturally after eight hours' labour. The uterus contracted well and there was no *post-partum* hæmorrhage. The child had hypospadias, was feeble and only lived three days. Involution was good. The highest temperature was  $98\cdot8$  (twice). The patient left the hospital well on March 21st, 1910.



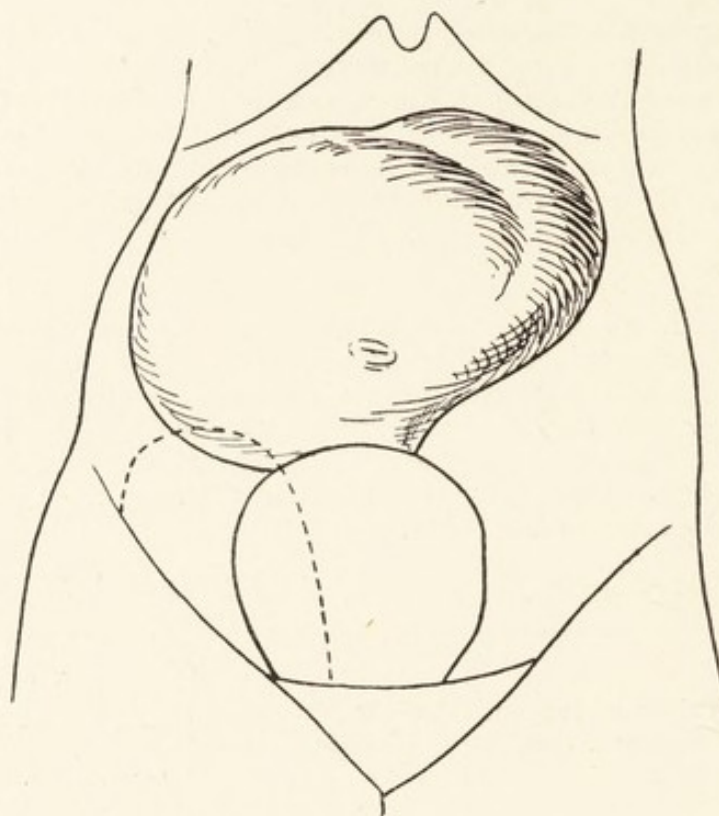


FIG. 11.—Case 12, immediately after labour. The dotted line shows distended bladder.

I subsequently saw the patient and advised the removal of the tumour as it was adherent to the abdominal wall and tender, but the patient neglected to come to the hospital and 18 months later she had a second living child delivered with forceps.

She was readmitted to U.C.H., on July 19th, 1913, pregnant for the third time and the tumour was removed at the sixth week of pregnancy on July 24th, 1913. The tumour weighed  $3\frac{3}{4}$  oz. and measured  $3 \times 2 \times 1\frac{3}{4}$  inches. It was very firmly adherent to the omentum and to the abdominal wall at the umbilicus. On superficial examination it did not appear to be degenerated, but on section areas of calcification were seen in the capsule and the tumour was soft and had undergone cystic degeneration at one spot. The wound healed by first intention and the patient left the hospital on August 12th, 1913, quite well, the pregnancy continuing and terminating on March 14th, 1914, in the birth of a living child weighing 6 lb. 10 oz.

In 1916 and 1917 she had miscarriages and since November, 1918, she has had pains and increasing loss at the periods.

In November, 1919, the uterus which was found to be retroflexed, rather low down, and slightly enlarged, could easily be pushed up and showed no sign of fibroids.

CASE 14 (Table A, No. 4).—K.B., a primigravida, aged 26, was admitted on November 8th, 1911. She had been married on August 27th of that year. She had noticed a lump in the abdomen and pain for five weeks; the pain had been very severe during the last two or three days. A hard tender tumour as big as a large orange reaching up  $2\frac{1}{2}$  inches above the pubes was found attached to the front of the retroflexed uterus 11 weeks pregnant. It was diagnosed as an ovarian tumour with twisted pedicle. At the operation on November 11th it was found to be a myoma attached



by a pedicle (not twisted) to the front of the body. The pedicle was cut across and numerous ligatures of silk were applied to stop the oozing: the peritoneum was stitched over the stump and the abdominal wound closed without drainage. The operation lasted 60 minutes.

The tumour weighed 1 lb. 1 oz. and measured  $3\frac{1}{2}$  inches, the pedicle  $1\frac{1}{2}$  inch in diameter. There was a little lymph on the surface and the tumour was congested. It was in section greyish-red at the periphery and dusky-red in the centre. Several vessels in it appeared to be thrombosed. Near the pedicle for  $\frac{3}{4}$  inch the tumour was white. It was slightly degenerated in places. The tumour was sterile on bacteriological examination.

An afebrile recovery ensued, the temperature only once rising above  $99^{\circ}$ . The patient left the hospital on December 5th.

She was readmitted on May 25th, 1912, in labour at term and was delivered, 272 days after marriage, of a living female child which presented in the first vertex position and weighed 7 lb.  $15\frac{1}{2}$  oz. An excellent recovery ensued, the temperature only once rising above  $99^{\circ}$  (on the third day,  $100^{\circ}$ ).

The mother and child left the hospital quite well.

CASE 15 (Table A, No. 1).—A degenerated and cystic fibroid may closely resemble an ovarian tumour and sometimes cannot be distinguished from it as in the case published in the 'Obstet. Soc. Trans.,' vol. 46, p. 122, in which I removed on July 5th, 1901, from a patient, aged 41, a tumour of which the solid part was over 17 lb. in weight and 1 foot in diameter, from the left broad ligament during labour. The child, dead before the operation, was easily delivered eight hours later. The patient had previously had four children; at the last labour twins, six years ago. The labours were all normal and the patient had never aborted. She had been very healthy all her life and first noticed considerable enlargement of the abdomen two years ago, but always noticed that the abdomen did not go flat after the labour.

In the following case, in which a pedunculated reniform tumour was found at the fourth month, rotation had occurred and had been followed by inflammation and probably sepsis.

CASE 16.—Mrs. S., aged 27, a nullipara, was suddenly seized with pain and inflammation on the left side of the abdomen when four months pregnant. A tumour was found on the left side of the body of the uterus, very tender on examination, and was diagnosed as a twisted dermoid. The patient was removed without delay to a nursing home and the tumour removed by abdominal section on May 20th, 1906. There were no adhesions but there was a little pus around the tumour which was greatly congested owing to twisting of its pedicle, which was attached just inside the insertion of the left round ligament. Some difficulty occurred from hæmorrhage owing to the vascularity of the pedicle; but the hæmorrhage was stopped by understitching with fine silk.

The patient progressed fairly well for two days, then had suppression of urine, secreting only  $1\frac{1}{2}$  oz. in 16 hours, the urine containing one-third albumen and bile, and she died on the third day.

A *post-mortem* examination was not obtained and the tumour was not examined for micro-organisms, but the presence of pus shows that it was probably infected, and I think that death was probably due to septic thrombosis of the ovarian and renal veins.



The tumour was a reniform subperitoneal pedunculated myoma weighing 9 oz. and measuring  $11\frac{1}{2} \times 7 \times 5$  cm.

The raw surface of attachment was at the "hilum." The section showed numerous hæmorrhages into the tumour and green patches near the surface. There was a small tag of lymph on the surface (U.C.H., Gyn. Cat. 1911, No. 270).

CASE 17.—On March 5th, 1906, I saw with Dr. Burney of New Cross, a lady, aged 30, suffering from pelvic peritonitis after a miscarriage, at the fifth or sixth week of pregnancy; the ovum had been thrown away by the nurse. As there was a considerable mass of exudate and an indistinct tumour in front of the retroverted uterus it was not certain at the first examination that the case was not one of hæmatocele and tubal mole.

On March 21st I saw the patient again and could feel a distinct hard tumour in front of the uterus which was thought probably to be a dermoid, though it felt harder than dermoids in that situation usually do.

At the operation (abdominal section) on March 26th, it was found to be a kidney-shaped myoma growing from the right side of the front of the body, being attached at its hilum by a short pedicle just internal to the right round ligament. The tumour which was adherent to the omentum, was enucleated, the vessels of the raw surface understitched and the peritoneal edges carefully apposed by fine silk stitches. The pain from which the patient had suffered ceased after the operation and an excellent recovery ensued, the wound healing by first intention and the temperature only once reaching as high as  $99.2^{\circ}$ . The tumour (U.C.H., Gyn. Cat., No. 267) weighed 1 lb. and measured  $11.5 \times 9 \times 5$  cm. It had undergone extensive hyaline degeneration, was very vascular, and had adhesions on the surface.

The tumour had not undergone axial rotation owing probably to the early pregnancy and the retroverted position of the uterus. The patient has borne two children since the operation.

CASE 18.—M. R., aged 33 (children 0, abortion 0), married four months, in good health, was seen by me on September 21st, 1908. She had last menstruated on July 19th—25th. She had several subperitoneal fibroids, which reached an inch above the umbilicus, and one, as big as an apple, behind the cervix of the uterus, which appeared to be two months pregnant. I advised that she should be carefully watched, and have Cæsarean section at term. Ten days later, at her home in Staffordshire, she had an attack of intestinal obstruction, which, after eight days, was operated upon (supra vaginal hysterectomy being performed) by Mr. Spanton (see 'Proc. Roy. Soc. Med., Obs. and Gyn. Sect.,' vol. 2, p. 87). At the operation it was found that a loop of ileum had become gripped in the sulcus between the large subperitoneal tumours. \*This sulcus was evident when I saw the patient and is noted in the diagram taken at the time; but its potential danger was not realised. The patient unfortunately did not recover.

CASE 19.—S., aged 28, nullipara, was seen by me in consultation with Dr. Orr, of East Finchley, on February 17th, 1915, when seven months pregnant. There was a sessile subperitoneal fibroid at the left corner of the uterus as big as a hen's egg, and another of the size of a walnut at the right side of the middle of the body, and this tumour was well above the brim of the pelvis, which it had occupied at an earlier stage of



pregnancy. The pelvis was normal. There was a considerable amount of pain and tenderness over the fibroids. I had operated on two of her sisters by myomectomy and hysterectomy for fibroids. The pain was lessened by rest and bromides. She was delivered at term of a living child without difficulty, and on January 20th, 1916, I removed the fibroids by abdominal myomectomy. Three were removed from the back of the body and one from the front; several seedlings were also excised. The largest tumour had diminished to the size of a walnut. The patient made a good recovery.

CASE 20.—C. M., aged 30, married a few months, had not been pregnant, but was very anxious to have a child. She had a fibroid, which was found to weigh 2 lb. 1 oz. and measure  $14.4 \times 13.8 \times 8.7$  cm. It was hard, nodular, covered with large veins, and attached by a surface 6 cm. in diameter to the greater part of the back of the body of the uterus. She had begged me not to remove the uterus if it could be avoided. Abdominal myomectomy was performed and the surface stitched over with fine silk on January 11th, 1919. The patient resumed marital relations in May and became pregnant at once. The pregnancy is proceeding normally at the sixth month in November, 1919.

CASE 21.—F., aged 24 (as shown by her certificate of birth), had the fundus of the uterus, with a fibroid weighing 4 lb. 9 oz., removed on February 26th, 1895 (see 'Obstet. Soc. Trans.,' vol 40, p. 228), the pedicle being treated extra-peritoneally by the *serre-nœud* and causing a ventrofixation. The patient having married and became pregnant, the development of the uterus could only take place at the expense of the posterior wall, an acute ante flexion of the pregnant organ resulting. Cæsarean section was performed on January 13th, 1903. The mother made a good recovery; the child also was strong and healthy, but lost its life from hæmorrhage from the cord, owing to a badly tied ligature.

The next three cases are examples of *retroversion* and *retroflexion* of the pregnant myomatous uterus.

CASE 22.—In the first case a fibroid of the size of a thick hunter watch was situated low down on the anterior lower segment or the upper part of the cervix of the uterus, which was retroverted. Retention of urine occurred. After repeated evacuation of the bladder with the catheter, the uterus rose out of the pelvis and subsequently, when the bladder became distended, the tumour could be felt by dipping, giving a pseudo-ballotement very like that given by the fœtus floating in liquor amnii. The tumour caused no further trouble during the pregnancy and labour.

CASE 23.—In the second case a fibroid nearly as big as an orange was felt in the pelvis, and above it the retroverted uterus, pregnant nearly two months. The uterus was replaced and the myoma was then found to be attached to the left corner of the body; it must, therefore, have twisted the uterus through  $90^\circ$ . The pregnancy continued normally and terminated in the birth of a living boy on January 4th, 1920.

CASE 24.—The third case\* was one of acute retroflexion of the uterus, produced by an adherent fundal myoma (Table C, No. 3). The noteworthy feature of this case was the bulging and thinning of the lower anterior segment, owing to the distension of the uterus having taken

\* 'Proc. Roy. Soc. Med.,' Obs. and Gyn. Sect., vol. ii, p. 74 (1909).



place at the expense of the anterior wall. Similar cases have been published by Herman\* and Varnier and Delbet.† Herman's case, treated by Porro's operation, terminated fatally; the other two mothers recovered. In all three cases the death of the child before the operation was undertaken points to the necessity of operating before labour sets in.

Acute *anteflexion* (resulting from the fixing of the stump of the fundus to the lower abdominal wall) was met with once. (Case 21.)

CASES 25 and 26.—These were instances of fibroids causing *inversion* of the uterus after abortion and labour. The tumours were successfully enucleated and the uterus replaced. They are being published in the 'Proc. Roy. Soc. Med.,' Obs. and Gyn. Sect. for this year (vol. 13).

CASE 27.—A cystic myoma (U.C.H. Museum Gyn. Cat., 1911, No. 266) behind the cervix may present great difficulties in diagnosis as in this case in which it was mistaken for a dermoid tumour (see 'Obstet. Soc. Trans.,' vol. 43, p. 110). The tumour was as big as a small lemon, the thickest part of its wall measured only  $\frac{1}{2}$  inch: the contents pultaceous like that of dermoids. It had caused difficulty in two previous labours and was removed by posterior colpotomy. In spite of iodoform gauze packing through the colpotomy wound intraperitoneal hæmorrhage occurred to the extent of about a pint, necessitating abdominal section 11 hours later and the ligation of two veins. The patient recovered well and subsequently had a child without any difficulty.

CASE 28 (Table C, No. 6).—M. E., aged 42, married three years, primi-gravida, was admitted to U.C.H. on September 15th, 1916, complaining of a lump in the abdomen for the last nine months. She was last unwell on December 28th, 1915; previously she had been regular (four weeks, four to five days) and had no dysmenorrhœa but much menorrhagia.

She had been seen by me in April and found to have a tumour of the size of a foetal head attached to the left side of the pregnant uterus (see Fig. 12).

On September 29th pelvic measurements were  $10 \times 11 \times 7\frac{3}{4}$  inches, diagonal conjugate  $4\frac{1}{4}$  inches. A tumour of the size of the foetal head was felt in the lower segment, also another small myoma on the left side of the body. The head was high up above the brim. The pelvic outlet was a little contracted. As the patient had a slightly contracted pelvis, was a primigravida of 42, and was very anxious to have a living child, Cæsarean section was performed and was followed by total abdominal hysterectomy, September 30th, 1916. The internal conjugate was measured at the operation and found to be  $3\frac{1}{2}$  inches. The child was delivered in 50 seconds, the total operation lasted 54 minutes. The wound had healed by first intention on the eighth day, but the temperature was raised up to  $101^{\circ}$ , and on the 14th day a little pus was found oozing from the upper end of the incision. This was due to a roll of gauze which had been inadvertently left in the abdomen. After removal of the gauze the temperature gradually fell and the patient left the hospital well on November 13th, 1916. Two years later she and the child were in excellent health. The uterus measured  $9\frac{1}{2} \times 7 \times 4\frac{3}{4}$  inches and the myoma on section  $3\frac{3}{4} \times 2\frac{7}{8}$  inches. The thickness of the uterine wall varied from  $1\frac{1}{2}$  inches to  $\frac{3}{4}$  inch except just above the fibroid where

\* 'New York Journ. of Gyn. and Obs.,' vol. iii, p. 484 (1893).

† 'Ann. de Gyn.,' vol. xlvii, p. 102 (1897).



it was  $2\frac{1}{4}$  inches. Over the fibroid it was  $\frac{1}{4}$  inches thick. At the middle of the Cæsarean section wound the wall was 1 inch thick and the

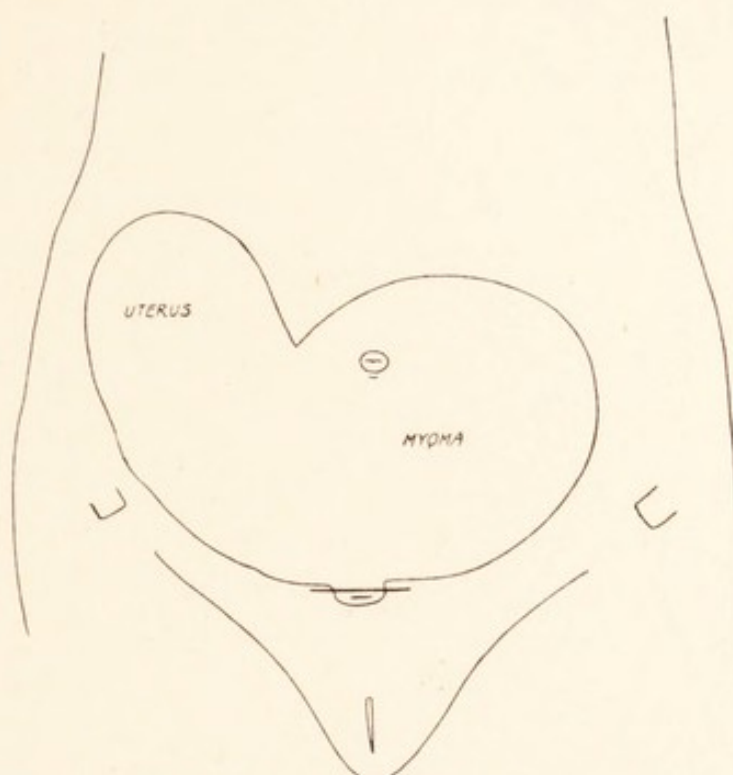


FIG. 12.—Case 28, pregnant  $3\frac{1}{2}$  months, showing large myoma on left side of lower segment.

prominence of the lower end of the fibroid reached to within  $1\frac{1}{2}$  inches of the external os; the lower end of the uterine incision extended to within  $2\frac{3}{8}$  inches of the external os. The fibroid was pinkish-yellowish-grey in the centre and was degenerated. An experienced obstetric physician had examined this case a fortnight before the operation and had said that no tumour was to be felt.

CASE 29 (Table C, No. 5).—C., aged 40 (children 0, abortion 0), married nine years, was sent me by Dr. Pretty of Kettering on April 1st, 1914. She had been known to have fibroids of the uterus for three years and had suffered from frequency of micturition. Three weeks before I saw her she had an attack of sciatica on the right side. She had not menstruated for 10 weeks (last period January 27th). On examination she was evidently 10 weeks pregnant, but on the top of the pregnant organ was a mass of sub-peritoneal fibroids which rose to a height of  $5\frac{1}{4}$  inches above the pubes. Behind the cervix was a mass as large as an apple, coming into the pelvis as low almost as the external os (see Fig. 13).

On July 1st a tender myoma as big as an orange projected from the left cornu; the mass behind the cervix had risen out of the pelvis.

The pelvic measurements were sp. il.  $8\frac{1}{2}$  inches, cr. il.  $10\frac{1}{2}$  inches, ext. conj.  $7\frac{1}{4}$  inches. The pelvis was small and it was thought that the mass behind the cervix might interfere with the engagement of the head. The patient was very anxious for a living child; Cæsarean section was therefore performed on October 12th, 1914, and was followed by total abdominal hysterectomy. Mother and child recovered and were well four years later.

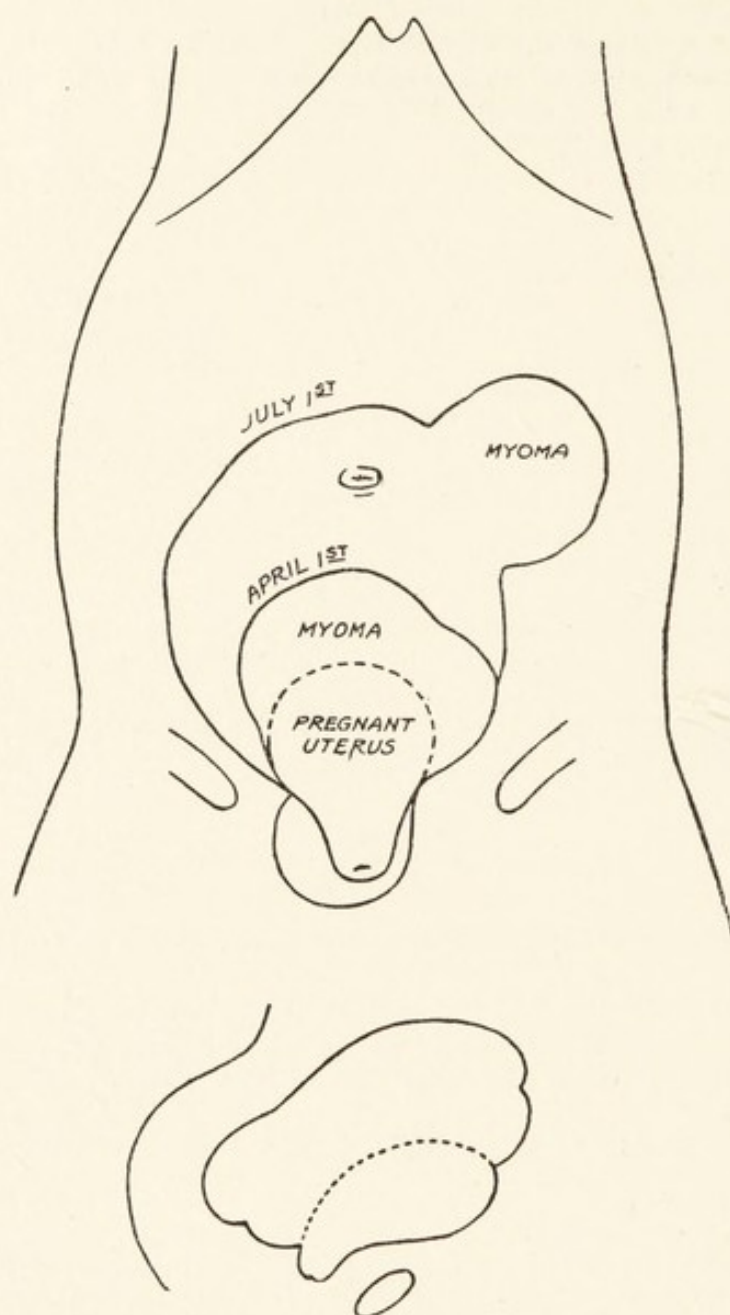


FIG. 13.—Case 29, 10 weeks pregnant: the upper figure also shows the condition three months later.

CASE 30 (Table B, No. 5).—A.S., aged 42, married, children 0, abortion 1 (December, 1914). She was married in 1904 and had been an in-patient on December 17th, 1914 at U.C.H. for incomplete miscarriage of about nine weeks, brought on by the use of abortefacients. The retained decidua was putrid and on removing it an intra-mural myoma as large as an orange was found in the anterior wall of the uterus. An iodine douche was given and gauze applied for 12 hours, as bleeding was profuse. She recovered well, though the temperature was raised to  $100^{\circ}$  on three occasions up to the ninth day and up to  $99.6$  on the 12th day; the pulse also varied from 80 to 96. She was advised if she became pregnant again to come to the hospital for Cæsarean section. Accordingly she was admitted to U.C.H. on February 21st, 1917, in good condition and near the term of pregnancy. The child was lying obliquely with







FIG. 14.—Case 30, showing uterus with tumour in coronal section,  $\frac{3}{4}$  natural size; cavities distended by gas in tumour and uterus; the tumour breaking down, deep red in colour, infected with *bacillus Welchii*, see fig. 15 (*ante*).



the head below displaced to the left by the fibroid which was felt in the lower segment, more on the right side than the left, as a softish tumour as big as a large orange which came down into the pelvic brim. Two other small fibroids were felt in the body. The pelvic measurements were normal ( $10\frac{1}{2}$ — $11\frac{1}{2}$ —8 inches). The temperature was slightly raised ( $99.4$  on admission) but afterwards till the operation only twice reached  $99^{\circ}$ ; the pulse varied between 88 and 104 (on admission 120). Caesarean section was performed on March 1st, 1917, at 1.30 p.m.

The patient had had slight pains all night and strong pains after midday. The abdomen showed a marked prominence above the pubes which looked like the distended bladder, but felt thicker walled. It was prominent but felt soft and fleshy when the uterus contracted: in the intervals between the contractions it felt of the same consistence as the rest of the uterus. The operation was a simple one; the uterus was sewn up with silk; the incision did not extend to the fibroid, which was not encroached upon. The child was delivered alive by the feet in 40 seconds and survived. The operation lasted 52 minutes. A submucous myoma as big as a walnut, to which the placenta had been attached and which had been felt on abdominal palpation was excised. The patient suffered severely from shock, although she had no pain and said she felt well; the pulse and temperature rose to 100;  $13\frac{1}{2}$  hours after the operation she had a rigor and the pulse became very rapid. On the second day temperature 101, pulse 120 to 166; on March 4th, 60 hours after the operation, at 1.30 a.m. she died. She had vomited repeatedly, but this had ceased on washing out the stomach. A good deal of flatus was passed per rectum on the second day and the patient felt comfortable. There was no tenderness of the abdomen. Although she said she felt well, but extremely weak, it was obvious she was sinking from acute sepsis.

*Postmortem.*—The abdomen was distended, the abdominal wound healthy. A little free fluid was present in the peritoneum and a few flakes of lymph. The bowel was distended with gas and had a film of pus over it in places. The deep surface of the wound in the abdominal wall showed early infection. The uterus was large and flabby, the incision was sloughy. The fibroid in the uterine wall felt soft and fluctuating. The uterus was hardened in formalin-salt solution. On opening it the fibroid was found to be of a deep red colour with cavities containing bloody fluid and bubbles of gas in the uterine wall as in gas gangrene. The weather was cold and gas was found in many other tissues of the body. The *bacillus Welchii* was found by Dr. Teale in the tumour (see Figs. 14 and 15).

In the following seven cases submucous tumours were removed after childbirth or miscarriage by enucleation through the os uteri:—

CASE 31.—In the out-door maternity of U.C.H. in 1897 a submucous fibroid measuring 5 c.m.  $\times$  2.5 cm. to which a piece of placenta and membranes were attached was removed immediately after labour from a patient, aged 41. It was situated on the posterior wall of the body and was associated with hæmorrhages during the pregnancy. The labour was natural till the third stage; the placenta was retained: it was during the manual extraction of the placenta that the tumour was discovered. The patient recovered well. Microscopic examination of the tumour showed hypertrophied muscle, adherent chorionic villi and dilated glands. (U.C.H. Gyn. Cat., 1911, No. 274.)



CASE 32.—A. C., 35, married, had had one pregnancy resulting in the birth of a living child 11 days before admission on July 21st, 1910. Three days before delivery she began to pass large clots and on the day before delivery she had a severe attack of hæmorrhage (placenta prævia). Version was performed and a living child delivered. During the following week she had several attacks of shivering with high temperature ( $104^{\circ}$ ). I saw her in consultation on the 11th day, found the uterus large and hard, reaching 8 inches above the pubes. A submucous fibroid, as big as a fist, could be felt on the right side per os (see Fig. 16). An offensive bloody

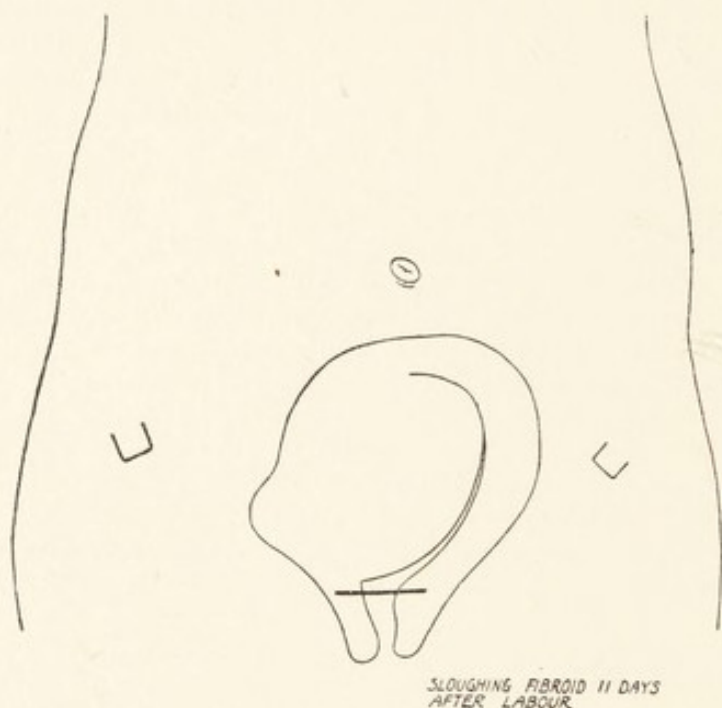


FIG. 16.—Case 32, showing submucous fibroid.

discharge was present. Vaginal douches of iodine solution were given and on July 30th the cervix was dilated by Hegar's dilators and the fingers. The tumour was seized with Doyen's cutting forceps and removed in pieces: the base was very adherent and in pulling on it the uterus was inverted. This enabled the remains of the tumour to be completely removed. The cavity was then swabbed with iodine solution (3i to Oj) and the uterus replaced. Iodoform gauze was packed in the uterus for a few hours. The tumour weighed 1 lb.  $3\frac{1}{2}$  oz. It was dull red in colour and in parts was covered with a yellow-green slough.

The operation lasted 35 minutes.

The temperature which had varied from  $104^{\circ}$  to  $100^{\circ}$  before the operation reached  $100.8^{\circ}$ ,  $100.8^{\circ}$ ,  $101.6^{\circ}$ ,  $103^{\circ}$  in the first four days, then gradually fell to normal. The patient left the hospital on August 18th, 1910, and wrote seven months later to say that she was quite well.

CASE 33.—I saw many years ago at U.C.H. with the outdoor obstetric assistant an exactly similar case. She was supposed to be suffering from severe septicæmia in the third week after labour. The temperature was  $105^{\circ}$  and there was an excessively foul discharge. The uterus was large and hard (I have never found the puerperal uterus to be so unless a fibroid is present). Through the os the lower end of the



tumour, which was as big as an orange, could be felt. The patient was admitted to the hospital and the gangrenous tumour easily enucleated with the finger. The patient's temperature fell and an excellent recovery ensued.

I have failed to find the notes of this case.

CASE 34.—S. W., aged 36, was confined by a midwife on November 5th, 1905. She had since had daily losses of blood, which had been very copious for the last four days before her admission on December 4th, 1905. She said she had felt something rolling about in the womb. During the pregnancy she had had a good deal of abdominal pain and also had had painful micturition. The temperature was  $100^{\circ}$ , pulse 84. The os was open and through it a sessile, submucous tumour was felt in the left side of the lower segment. It was easily enucleated. The temperature rose to  $102^{\circ}$  on the sixth and seventh days; otherwise it did not rise above  $99.6^{\circ}$  for three weeks. There was a slight thickening to be felt on the left posterior quarter of the pelvis on her discharge on December 30th. The tumour measured  $4.7 \times 3.3 \times 3.3$  cm. It was ragged on the surface except at one pole, where it was blood-stained and covered by thickened mucous membrane. Microscopical examination showed that the tumour was extensively degenerated and in parts inflamed, having a rich cellular appearance, closely simulating sarcoma.—(U. C. H. Gyn. Cat., 1911, No. 276.)

CASE 35.—On October 24th, 1898, at 11 P.M., I saw, with Dr. Webb, of Netley, Mrs. F., aged 34, suffering from fever (temperature  $100^{\circ}$ , pulse 120) and a foul discharge after a miscarriage which had occurred six days previously at the second month. A consultation had been held with local doctors and the finger had been passed into the uterus, the lining of which was smooth. The origin of the foul discharge was not discovered. Under chloroform I introduced my finger and found the smooth condition of the lower uterine canal, but I also felt bulging into the cavity a sessile submucous myoma as big as a walnut; above this, which acted as a ball-valve, some putrid decidua could be touched. I enucleated the myoma, removed a mass of putrid decidua, and washed out the uterus with 1 in 3,000 perchloride of mercury solution. The temperature fell to normal, and the patient recovered perfectly. I attended her subsequently in her confinement on December 23rd, 1901, which was quite normal; she also had a second child without any difficulty. She remained in good health till 1917, when she began to lose considerably, and the abdomen increased in size. She became cachectic. I saw her, in consultation with Dr. Blaikie and Sir Thomas Barlow, on October 5th, 1917. She had a large, fixed, irregular, uterine tumour, nearly filling the abdomen, especially on the left side. She had also pleural effusion and hæmoptysis and other signs of growth in the lungs. From the cachectic condition, the hæmorrhages, and foul discharge it appeared probable that the growth was a uterine sarcoma.

She gradually wasted and died in February, 1918, nearly 20 years after the enucleation of the fibroid.

CASE 36.—E. M., aged 32, married a year, had had no child, but two miscarriages, ten months and three weeks before admission (May 19, 1902). Menstruation began at the age of 13, was regular every four weeks, lasting four to five days, painful and rather profuse.

A lump was noted at the last miscarriage (at  $3\frac{1}{2}$  months) and the temperature afterwards was high ( $102^{\circ}$  to  $104^{\circ}$ ); the pulse varied from 100 to 120.



The cervix was closed and there was a very foul discharge from the cavity. The uterus contained a fibroid as big as an orange, which at first was thought to be intra-mural. After douches had been employed without lowering the temperature, the uterus was explored.

A submucous tumour as big as an orange could be felt through the dilated cervix. The tumour was sloughing and was removed *per vaginam* on June 10th by enucleation from the right side of the fundus, intra-uterine douches having previously been given on account of the foul discharge. Iodoform gauze was then employed for a few hours. The temperature, which had risen to 103°, every day for a week before the operation, at once fell and remained at or a little above normal till her discharge on June 21st, 1902.

CASE 37.—F. R., aged 31, married at 24, had had two children, one delivered with forceps 13 months after marriage, and a second child at the age of 28, since which time she had bled profusely for a week, passing clots and using 30 diapers during menstruation, which was very painful. She had had bearing down and prolapse of the uterus since the first child was born.

Menstruation began at the age of 12, was regular every four weeks, lasting two to three days, and requiring seven to eight diapers.

On admission, July 2nd, 1900, she was bleeding profusely as a result of an early miscarriage on the same day.

A tumour as large as a goose's egg could be felt attached by a broad base to the left side of the fundus, and above it on the right was some friable decidua (see Fig. 17).

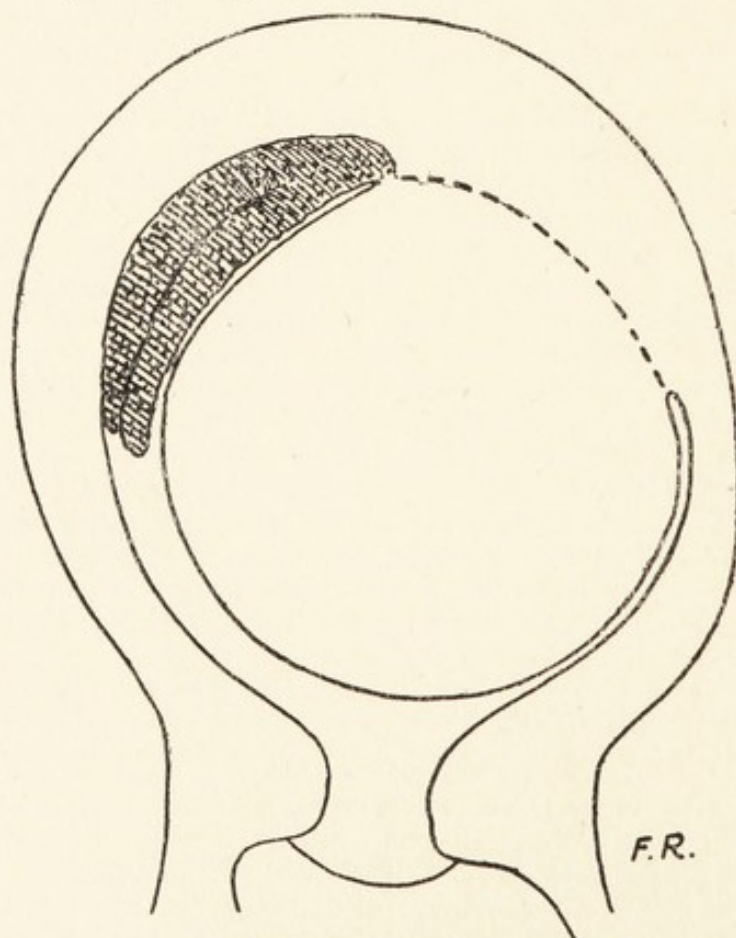


FIG. 17.—Case 37, showing submucous fibroid and decidua.



On July 3rd the tumour was removed by enucleation and the decidua removed by the finger, and an intra-uterine douch was given.

The temperature (99.6°) fell practically to normal and remained so till the 14th, when colporrhaphy and perineorrhaphy were performed. The wounds healed well.

Fifteen months later, on October 17th, 1901, the patient was delivered of a living child.

*Frequency.*—Fibroid tumours complicating pregnancy are quite common, though very divergent opinions have been expressed by eminent obstetricians on this point. Thus, Landau states that in the Charité, amongst 19,052 labours fibroids were found only 6 times, and Schauta, in 55,311 pregnancies, found only 54 cases of myoma. Pinard, in 13,915 pregnancies, found 84 cases of myoma; and Pozzi, in 12,050 pregnancies, found 83. I have no doubt that the French obstetricians' figures most nearly represent the frequency with which this complication is diagnosed, but necessarily somewhat underestimate the actual frequency, owing to small or inaccessible tumours escaping observation. I think it may be stated with an approximation to accuracy that fibroids occur about once in 150 pregnancies.

*Age at which Fibroids occur.*—Bayle, in 1813, wrote that "fibroids scarcely ever appeared before the age of 30 years," but were present in nearly every woman over 40 who had preserved the physical signs of virginity; and Virchow gave it as his experience that he had examined the corpses of few old virgins in which fibroids were not found, although in many women who had borne children the uterus remained free from them even in extreme old age.

It is now known that fibroids occur, though rarely, before the age of 25 and are practically unknown before puberty.\*

In view of the slow growth of these tumours, of their occasional occurrence at an early age, and their giving rise to severe dysmenorrhœa years before they become manifest clinically, it has been suggested that fibroids are of congenital origin. Essen-Möller has examined the uteri of 20 fœtuses and sucklings, and I have examined the uteri of 100 still-born girls, without finding any signs of myoma.

Taking the ordinary period of woman's fertility at 30 years, the fact that in the first 10 years she may become pregnant, but is extremely unlikely to have a fibroid, and only in the next 20 years is liable to have both, invalidates most of the voluminous statistics

\* See H. R. Spencer, 'Obstet. Soc. Trans.,' vol. xl, p. 228.



of sterility and abortion in women with fibroids, into which I shall not enter here.\*

There is no doubt that fibroids have a certain influence in causing sterility and abortion, but it is a slight one. Hofmeier is even of opinion that they *increase* fertility, but his statistics are not convincing. On the other hand, there seems to be reason to believe that sterility favours the occurrence of fibroids, and that regular childbearing and suckling prevent, to some extent, their occurrence (Bayle, Virchow, Pinard).

*Effect of Pregnancy on Fibroids.*—When a patient with fibroids becomes pregnant the tumours usually increase in size from oedema, hypertrophy, and hyperplasia; the muscle cells become greatly hypertrophied, often swollen, sometimes vacuolated, and occasionally developed into large cells resembling the decidual cells of the endometrium (Gordon Ley). The tumours vary in their development: they usually enlarge. Sometimes no increase is noticeable, occasionally they appear to diminish and their shape is apt to become flatter and their consistence softer than in the unimpregnated organ. They may become more prominent as pregnancy proceeds and alter their shape to clinical examination, owing to change in their location or axes. They may become fixed by impaction in the pelvis or by inflammation resulting from mucous degeneration, necrobiosis, or infection. The necrobiotic fibroid is either grey or pinkish grey or red (usually of a dusky tinge)—the so-called “red degeneration,” which is not confined to pregnant uteri, and in my experience is quite as common in the unimpregnated. Degeneration of the fibroid is sometimes accompanied by degeneration of the uterine muscle, which may be more markedly affected than the tumour. The degenerated fibroid may be sterile or may be infected, and occasionally suppurates, especially in the puerperium. It would appear that the degenerated or cystic fibroid forms a good cultivating medium for micro-organisms which may be dormant during the pregnancy. I have found an abscess containing a pure culture of streptococci in the centre of a fibroid in a virgin, who gave no clinical sign of its presence except a cachectic appearance. It seems then that infection of degenerated fibroids may occur from the blood-stream; the ordinary route of infection *per vaginam* often leads to necrosis of submucous tumours, examples of

\* See Troell, ‘Studien über das Uterusmyom in seinen Beziehungen zu Konzeption, Schwangerschaft, Geburt und Wochenbett,’ 1910.



which have been given. Calcification sometimes occurs in fibroids complicating pregnancy, whether the tumours are of uterine or ovarian origin. *After labour* the tumours usually diminish in size and may alter in shape, owing to their rearrangement in the emptied organ. The sub-peritoneal tumours sometimes do not diminish very markedly (Case 12) in the puerperal month. Their apparent rapid diminution is rather due to increased difficulty of examination. They sometimes undergo very rapid involution, as in Lorain's\* case, where a tumour, easily felt, as big as the head of an eight-month foetus at the time of labour, was found *post mortem* to have diminished on the 22nd day to the size of a hazel-nut.

As fibroids undoubtedly in some cases undergo great diminution, they are supposed occasionally to disappear after labour. Olshausen's cautious opinion is that it is "not altogether impossible."

In view of the occurrence of rupture of cystic fibroids in the unimpregnated, of which I have seen an example, it is remarkable that there does not appear to be recorded a case of rupture of the pregnant uterus before the onset of labour. Rupture of veins with intraperitoneal hæmorrhage is very rare (Gusserow, Schmorl, L. Meyer, Hamilton, quoted by Troell). The two cases I have met with occurred in nulligravidæ.

Torsion of pedunculated tumours sometimes occurs (Cases 16, Table C, No. 2); it is especially liable to happen in the kidney-shaped tumours with pedicle at the hilum (Case 16, and Ribemont-Dessaigues and Grosse's case, quoted by Troell). It is a dangerous accident, three out of 21 cases collected by Troell and one out of my three cases having terminated fatally. This torsion may be transmitted to the uterus and even to the vagina. Troell gives a list of 21 cases of torsion of the pregnant uterus produced by fibroids.

*Effect of Fibroids on Pregnancy.*—Ectopic pregnancy is rarely met with (Table C, No. 2). In 1886, Gusserow could only find two cases recorded. The specimen from one of these is in the museum of U.C.H., the case published by Harley in the first volume of the 'Obstetrical Transactions,' which Mr. Lawrence and I, in preparing the 'Gynæcological Catalogue' of U.C.H. Museum (1911), found to be a ruptured uterine horn, and not a ruptured tube, as described. Troell, in 1910, found 49 cases of tubal pregnancy recorded in literature, but Harley's case should be excluded. I am able to add second specimen from U.C.H. Museum, sent to me by Mr. Bates.

\* 'Gaz. des hôp.,' 1869, No. 92, p. 361.



Placenta prævia is said to occur with unusual frequency with uterine fibroids (Case 32). It is probable that hæmorrhages due to submucous fibroids, or to the insertion of the placenta upon them, are sometimes erroneously attributed to placenta prævia. In Case 30 the placenta was situated over a submucous tumour, but gave rise to no hæmorrhage during the pregnancy; the hæmorrhage in such a case may, however, lead to the discovery of the tumour (Case 31).

While abortion, except in the case of submucous tumours, does not appear to occur with much greater frequency than in normal uteri, both premature and post-mature labour are apt to occur.

Pain or tenderness over the tumour or uterus are frequent symptoms, especially in necrobiotic tumours. The pain is usually easily relieved by rest, light diet, and anodynes. The "unbearable pain," which some authorities have given as a justification for performing hysterectomy in early pregnancy, I have never met with. In cases of torsion, or inflammation, or infection of the tumour, the symptoms are acute, and require prompt surgical interference. Pressure by the tumour on the veins may cause œdema of the lower limbs; albuminuria is not uncommon, and ascites may occur (Table C, No. 2; also Landau's case). Abnormal (especially breech) presentations are frequently met with. The labour is often surprisingly easy, in view of the advanced age of many of the patients (Cases 2, 5, 6, 7). Even in the case of tumours encroaching on the brim, it is found that the tumour is often drawn out of the way during labour. In some cases forceps may be required for inertia. Retention or incarceration of the placenta or decidua may occur (Cases 31, 35, 37), and *post-partum* hæmorrhage in cases where the submucous tumours are present may be severe. On the whole, in cases suitable for delivery, *per vias naturales*, the labour is often normal, even when the tumours in the upper part of the uterus are quite large. In cases, however, where injudicious attempts are made to deliver the child by forceps or version past tumours even of small size, dangerous bruising of the tumours, or even rupture of the uterus, may occur.

*Diagnosis.*—The diagnosis of pregnancy and of fibroids sometimes presents difficulties, which are increased when the two are combined. It is more likely that a mistake will be made over the pregnancy than the fibroid. In the first half of pregnancy, the great factors in the diagnosis are the suppression of the menses,



even if only for a few days, and a uterus larger than it should be and irregular in shape, the irregularities being hard. A uterus may be irregular from pregnancy in one cornu—a lopsided uterus—but it has the normal consistence; when it contracts and becomes hard, it assumes the normal shape. If the pregnancy is advanced to the second or third month, the softness of the cervix and body are characteristic, the latter being sometimes best felt per rectum.

In the early months, the points to bear in mind are the cessation of menstruation, the rapid growth of the tumour, the consistence of the uterus, and the hard irregularities upon it.

In the second half of pregnancy, when the “certain” signs (heart-sounds, parts or movements of the child, and ballottement) are available, difficulties sometimes are met with. In very rare cases, of which I have seen only two or three instances, the uterus remains as hard as a fibroid throughout pregnancy, and is not subject to those periodical relaxations and contractions which ordinarily characterise it. On the other hand, a degenerated fibroid uterus, by its consistence and livid appearance, may closely simulate a pregnant uterus with its contained foetus, but, of course, the certain signs and the breast changes are absent; menstruation is usually excessive, and I believe the bulging of the anterior lower segment, which is sometimes seen in the case of fibroids, is never met with in normal pregnancy, though it may be found extremely marked in retroflexion of the pregnant uterus, produced by fibroid of the fundus adherent in the pelvis (Case 24). When there are irregularities on the surface of the pregnant uterus, the diagnosis is simplified; the prominences are hard, the pregnant uterus soft and contractile; the fibroids do not alter their position, as parts of the foetus do, and they may become more marked during uterine contractions, which obscure the foetal parts; at most, the tumours have a slight mobility, but return to the same position even when repeatedly examined. Large subperitoneal or intramural growths, or small multiple growths, may render the palpation of the foetus difficult till the pregnancy is somewhat advanced.

If the fibroids are degenerated they may feel softer than the rest of the uterus when the latter contracts (Case 30). When cystic and of large size they are difficult to distinguish from ovarian tumours (Case 15): the same difficulty may occur in diagnosing



twisted fibroids in the acute stage, though the hardness will be in favour of uterine fibroid, and the age of the patient may assist the diagnosis.

In all cases of difficulty, especially with impacted or inflamed tumours, examination under anæsthesia is of the greatest value.

I need only allude to the resemblance of a horn of a double uterus to a fibroid, for which it has been mistaken, and has led to the sacrifice of the uterus when excision or even replacement of the horn would have sufficed.

After the birth of the child the diagnosis of sub-peritoneal and intra-mural tumours is usually easy, owing to the lax state of the abdominal wall and the smaller size of the uterus. Submucous tumours may be overlooked, unless they give rise to hæmorrhage or to fever from necrosis or gangrene. If the uterus is large and hard in the puerperium, a submucous fibroid should be suspected and the uterus should be explored. Fever may arise either from retention of the products of conception or from infection of the tumour, especially if it has undergone degeneration. A tender subperitoneal tumour in the puerperium associated with fever will suggest infection. I have known a large intra-mural tumour mistaken for a second twin; in that case, the hardness of the tumour and the absence of signs of the foetus rendered the diagnosis easy; but if the tumour were degenerated, considerable difficulty might arise, which would be overcome by exploration through the cervix.

A fibroid impacted in the pelvis, especially if it is cystic (Case 27), may closely resemble an ovarian cyst, and a subperitoneal fibroid, after abortion, may resemble a tubal mole, from which its hardness distinguishes it. Inversion of the uterus is met with, usually some weeks or months after labour or abortion. In addition to the usual signs of inversion, there will be a tumour usually separated by a groove and distinguishable from the uterus by its harder consistence. A case of mine in which these two points of distinction were absent is, so far as I know, unique. (See 'Proc. Roy. Soc. Med. Obs. and Gyn. Section,' vol. xiii.)

*Prognosis.*—The prognosis is, in the great majority of cases, good when the patients are attended with judgment and careful regard for asepsis. The three fatal cases here published, which are all that I have met with, are examples of dangers which sometimes arise. The first death (Case 18) from intestinal obstruction, due to nipping of the ileum between two subperitoneal fibroids, is a very



rare accident, of which I have not been able to find another example. The other two deaths (Cases 16 and 30) suggest the necessity of bacteriological examination of the tumour before resorting to conservative abdominal operations.

*Treatment.*—The great majority of cases require only careful supervision during pregnancy, periodical examination of the urine, and rest, mild aperients and anodynes if the tumours become painful.

Induction of abortion and premature labour and forcible delivery past obstructing tumours are contra-indicated.

Forceps may be required for inertia, but should never be used to overcome resistance caused by tumours.

Craniotomy and embryotomy are called for only in cases where the foetus is dead and the mother not infected.

Polypi and pedunculated subperitoneal tumours should be removed.

*Vaginal myomectomy* may be required for cervical fibroids, but should not be performed for retro-cervical tumours.

*Abdominal myomectomy* is rarely needed and usually only for very large or twisted or necrobiotic tumours. It not infrequently leads to abortion and to hysterectomy in order to stop the hæmorrhage from the bed of the tumour, and it often fails to remove all the tumours present in the uterus.

Before performing myomectomy, as also before conservative Cæsarean section, *the tumour should be examined bacteriologically*, and if it is infected the whole uterus should be removed.

*Hysterectomy during early pregnancy*, in the absence of hæmorrhage or infection, is rarely called for.

Myomectomy and hysterectomy in early pregnancy are frequently performed by some gynæcologists.

Thus, T. Landau\*—who has written an important monograph on the subject of myoma and pregnancy, illustrated by many fine plates of fibroid uteri containing little foetuses sacrificed in some cases, it appears to me, unnecessarily by the operation of hysterectomy—gives a list of 11 cases of abdominal myomectomy during pregnancy, apparently operated upon by his brother and himself. All the patients recovered and only one aborted. A careful reading of the history of the cases leaves a doubt as to whether the operation was in all necessary or advisable.

\* T. Landau, 'Myom bei Schwangerschaft, Geburt und Wochenbett,' 1910.



TABLE A.—*Author's Cases of Pregnancy complicated by Fibroids treated by Abdominal Myomectomy.*

No.	Initials.	Age.	Children.	Abortion.	Duration in minutes.	Date of operation.	Drainage.	Adhesions.	Recovery.		Tumour.	Remarks.
									Mother.	Child.		
1	B.	41	4	0	63	July 5, 1901	Gauze to broad ligament	To omentum and broad ligament	Yes	No (dead before operation)	Cystic myoma 1 foot in diameter, solid part over 17 lb., and several pints of fluid	Operation during labour (see 'Obstet. Soc. Trans.,' vol. 46, p. 122). (Case 15.)
2	M. S.	30	0	0	54	March 5, 1906	No	To omentum	Yes	—	Pedunculated twisted reniform tumour attached by hilum just internal to right round ligament 11.5 x 9 x 5 cm., vascular, degenerated, adhesions on surface	Operation 3 weeks after abortion at 5th or 6th week. (Case 17.)
3	S.	27	0	0	55	March 20, 1906	No	No	No	—	Pedunculated twisted reniform tumour attached by hilum just internal to left round ligament. Tumour 9 oz., 11.5 x 7 x 5 cm., hæmorrhage into it, pus around it.	Operation at 4th month of pregnancy. Patient died on 3rd day with suppression of urine, probably from septic thrombosis of ovarian and renal veins. (Case 16.)
4	K. B.	26	0	0	60	Nov. 11, 1911	No	To omentum	Yes	Yes	1 lb. 1 oz., 7.5 cm. in diameter, pedicle 3.7 cm. thick, lymph on surface; necrotic; sterile.	Operation at 11th week of pregnancy. Child 7 lb. 15½ oz., born 272 days after marriage; vertex presentation. (Case 14.)
5	A. I.	29	2	0	74	July 24, 1913	No	To omentum and abdominal wall at navel	Yes	Yes	3¼ oz., 7.5 x 5 x 4.5 cm., calcified and degenerated.	Operation at 6th week of pregnancy. Child 6 lb. 10 oz., delivered naturally; vertex presentation March 10, 1914. (Case 13.)

TABLE B.—*Author's Cases of Pregnancy complicated by Fibroids treated by Conservative Cesarean Section.*

No.	Initial.	Age.	Children.	Abortion.	Duration in minutes.	Date of operation.	Drainage.	Adhesions.	Recovery.		Fibroid removed.	Remarks.
									Mother.	Child.		
1	C.	34	0 (married 5 years)	0	58	March 1, 1907	No	No	Yes	Yes	No	Fibroid size of lemon in left lower segment; generally contracted pelvis; healed tubercle of sacro iliac joints and pelvis.
2	A.	31	2	0	43	Jan. 8, 1916	No	No	Yes	Yes	No	Fibroid size of grape right upper anterior wall; contracted pelvis. Several small fibroids found on Dec. 14, 1918, when Cesarean section successfully done for the 4th time—(H. R. S.)
3	S.	42	0	1	52	March 1, 1917	No	No	No	Yes	No (a small sub-mucous tumour removed)	Degenerated infected myoma of lower segment. <i>Bacillus Welchii</i> in tumour. Patient died of acute sepsis in 60 hours. (Case 30.)
4	B.	25	0	0	40	March 17, 1917	No	No	Yes	Yes	No	Pelvis contracted (3½-inch conj. vera); two fibroids size of grape and marble at back of uterus.
5	M.	38	1 (dead; forceps)	1	60	Feb. 8, 1918	No	No	Yes	Yes	No	Pelvis contracted (3½-inch conj. vera); one child delivered dead with forceps (difficult); small fibroid in anterior wall.



TABLE C.—*Author's Cases of Pregnancy complicated by Fibroids*

No.	Initials.	Age.	Children.	Abortion.	Duration in minutes.	Date of operation.	Drainage.	Adhesions.
1	A. D.	28	0	1	51	May 14, 1892	No	No
2	B.	28	0 (married 5 years)	0	75	March 18, 1905	No	A few around ruptured tube (ectopic gestation) Of pedunculated fibroid to Douglas
3	M. A. N.	38	0	0	58	March 29, 1908	No	
4	S. R.	37	3	1 (induced at 6½ months)	55	July 10, 1909	No	No
5	C.	40	0 (married 9 years)	0	90	Oct. 12, 1914	No	No
6	M. E.	42	0 (married 3 years)	0	54	Sept. 30, 1916	No	No

T. Landau also gives a list of 19 cases in which hysterectomy was performed in the early months of pregnancy: in some of the cases the pregnancy was not diagnosed before the operation: in others what was intended to be a myomectomy terminated in hysterectomy; one of the mothers died, the others were of course sterilised and the children sacrificed. The practice of hysterectomy in the early months of pregnancy is, in my opinion, much too common both abroad and in this country: I have never found it necessary.

In Table A are given my cases of abdominal myomectomy during pregnancy. Of the mothers, four recovered and one died (undelivered) at the fourth month of pregnancy. In No. 1 the child was dead at the time of the operation. In No. 2 abortion occurred before the operation. In Nos. 4 and 5, operated on at the eleventh week and sixth week, the pregnancy continued and living children were born.

Every endeavour should be made to enable pregnancy to be carried on until the child is viable when, a conservative or radical Cæsarean section may be performed.



*treated by Cæsarean Section followed by Abdominal Hysterectomy.*

Recovery.		Nature of operation.	Remarks.
Mother.	Child.		
Yes	Yes	Porro's operation (299 days after last menstruation)	(See 'Obstet. Soc. Trans.,' vol. xxxviii, p. 390.) Breech presentation. Labour obstructed by cervical fibroids. Mother quite well in 1914; the daughter 5 ft. 10 in. in height, well developed, recently married. Uterus weighed 6 lbs.
Yes	Yes	Cæsarean section + total abdominal hysterectomy	(See 'Obstet. Soc. Trans.,' vol. xlviii, p. 240.) Patient in labour. Footling presentation; membranes ruptured 8 hours; urine highly albuminous; ascites. Uterus 6 lbs. 2 ozs.
Yes	No (dead before operation)	Cæsarean section + total abdominal hysterectomy	(See 'Proc. Roy. Soc. Med.,' Obs. and Gyn. Section, vol. ii, p. 74.) Breech presentation. Operation for retroflexion of uterus by fundal fibroid adherent in Douglas's pouch; uterus 5 lb. 12½ oz. (with placenta). Operated on for spindle-cell sarcoma of left ovary, May 20, 1919.
Yes	Yes	Cæsarean section + total abdominal hysterectomy	(See 'Proc. Roy. Soc. Med.,' Obs. and Gyn. Section, vol. iii, p. 82.) Head presentation. Operation for painful fibroids and contracted pelvis. Difficult labour, last 10 years before; 1 child imbecile, injured by forceps. Uterus 2 lb. 14 oz., posterior wall 2 inches thick; hyaline degeneration of uterine muscle and fibroids.
Yes	Yes	Cæsarean section + total abdominal hysterectomy	Operation for painful fibroids and contracted pelvis. Fibroids in posterior lower segment in pelvis, but had risen at operation. Patient anxious for living child. In labour 3 hours; head presentation. (Case 29.)
Yes	Yes	Cæsarean section + total abdominal hysterectomy	Operation for fibroids and contracted pelvis; head presentation. Conjugata vera 3½ inches. Fibroid 3¾ inches in diameter, 2¼ inches thick in lower segment to level of internal os. Mother and child well in 1919. (Case 28.)

*Conservative Cæsarean Section* (Table B).—This is rarely indicated by the fibroids alone, but may be performed when fibroids are associated with contracted pelvis or malpresentations of the child, especially in elderly primiparæ. In the case of a single myoma it might be possible to remove the myoma and child through the same incision. Landau, who removed the uterus 19 times during early pregnancy, does not record a case of conservative Cæsarean section.

My five cases are given in Table B. In all contraction of the pelvis and the presence of fibroids were the indications for the operation. The five children survived: one mother died owing to my failure to discover the infection of the tumour. The case should have been treated by total abdominal hysterectomy.

*Cæsarean Section followed by Abdominal Hysterectomy.* (Table C).—Landau performed the operation in two cases only; the mothers and one child recovered; of the other child, it is stated that it was a well-developed boy, but whether it survived or not is not mentioned.

My six cases are given in Table C. All the mothers recovered,



and all the children survived except one, which was dead before the operation was performed.

Total hysterectomy, which was performed in five of the cases, is, in my opinion, preferable to amputation in pregnant as in non-pregnant cases, especially as it provides drainage and removes the possibly infected cervix.

Troell gives a list of 20 cases (including 2 of mine), operated on since 1900, with 2 deaths.

I am able to add 3 more cases (Table C, Nos. 4, 5, 6), making 23 cases with 2 deaths.

*In the puerperium*, vaginal myomectomy is 'usually the best treatment for submucous tumours, even when they are infected or invert the uterus. It should usually be tried before resorting to hysterectomy, which I have never found to be necessary.

In infected subperitoneal or intramural tumours, total abdominal hysterectomy should be performed.

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## LECTURE II.

### *Ovarian Tumour Complicating Pregnancy, Labour, and the Puerperium.*

TABLE D gives short particulars of all the cases I have seen except two: of these the first was a hospital patient who, although advised both before and during pregnancy, to have an ovarian tumour removed, refused and was delivered without difficulty; on the third day of the puerperium the tumour (containing 31 pints of fluid) burst spontaneously, causing the death of the patient as soon as she reached the hospital.\* The other case, the wife of a physician, had an ovarian tumour as big as a lemon. As it caused no trouble she was advised to await the occurrence of pregnancy. She had been married five years without conceiving. She became pregnant in 1918 and was delivered easily of a living child and, as the tumour causes no inconvenience, she does not wish it to be removed just yet.

In Table D, the column "Result of Labour to Child" gives the result of the labour preceding the ovariectomy in the patients operated on after delivery and following the ovariectomy in the

\* 'Obstet. Soc. Trans.,' vol. xliii, p. 224.



patients operated on during pregnancy, as shown in brackets in the column "Date of Ovariectomy."

Before proceeding to consider the question of treatment it may be well to analyse the columns of the Table.

*Age of the Patient.*

The oldest patient was 43 (Case 30), the youngest 20 (Case 21), the average age was 30.

*Number of Children.*

Nine of the patients were nulliparæ at the time the ovarian tumour was present. Three of these patients had multilocular cysts, one patient had a "parovarian" and an ovarian cyst, three had dermoids, two had ovarian fibroids.

The 55 patients had had 150 children, an average of nearly three, before the tumours were removed. Nine patients had had five or more children; one having had nine, and three having had 10 children.

*Number of Abortions.*

Thirty-three abortions had occurred before the ovariectomy in 48 patients; in seven of the cases there is no record as to abortion. Excluding these seven cases, we find that the remaining 48 cases had 125 children and 33 abortions (26·5 per cent.). We may suppose, therefore, that the seven cases would have had about two abortions; this would give 35 abortions for the 55 cases. The proportion of abortions to childbirth would thus be 35 to 150 or 23·3 per cent.

*Number of Abortions in 40 Cases not Operated on During Pregnancy.*

Thirty-two abortions occurred amongst 33 patients not operated on during pregnancy. Of the remaining seven cases there is no record of the number of abortions; but in none of the seven cases did abortion occur in the pregnancy preceding the ovariectomy. In only five of the 33 patients did abortion occur in the pregnancy preceding the ovariectomy, and about one case (Case 28) there is some doubt, the notes not recording *when* the abortion occurred. This gives an abortion rate of at most five in 40 cases, or 12·5 per cent. If Case 28 were included the abortion rate would be four in 39 cases or 10·3 per cent., or, if Case 28 did not actually abort in the pregnancy



TABLE D.—*Ovarian Tumours Complicating Pregnancy*

Case.	Initial.	Age.	Children.	Abortion.	Time of discovery of tumour.	Seat of tumour.	Nature of tumour.
1	C.	32	1	0	By patient 8 years ago; by doctor in Aug., 1891 (delivered June 2, 1891)	L. ovary	Suppurating multilocular cyst (2 gallons foetid pus)
2	J.	26	1	0	By patient 2 years ago; by doctor 1 year ago; by me during labour (Aug. 28, 1891)	L. par-ovarium	Unilocular cyst (10 pints) ...
3	H.	27	3	0	By doctor during pregnancy 1 month before operation	R. ovary	Multilocular cyst (6 pints); twisted pedicle
4	B.	41	2	0	During pregnancy and after labour (June 24, 1891). Tapped twice 3 weeks before admission (10 pints of pus)	R. ovary	Suppurating dermoid (3 pints pus); pedicle twisted
5	P.	35	6	0	10 days after labour (Dec. 15, 1891) ...	R. ovary	Multilocular cyst, size of uterus at term; pedicle twisted
6	C.	31	1	0	After labour, 21 months before operation	Both ovaries	L. multilocular cyst, size of 7 months uterus; small R. cyst
7	T.	39	10 (all living, vertex)	5	10 days after labour (Dec. 28, 1891) ...	R. ovary	Suppurating multilocular cyst, size of fist; pedicle twisted
8	J.	23	1	0	10 days after labour, 6 weeks ago ...	R. ovary	Suppurating cyst (15 pints)
9	H.	26	2	0	Shortly after labour (Mar. 25, 1892) ...	Both ovaries	Dermoids; R., size of walnut; L., size of swan's egg
10	N.	36	4	5	2 years before; confined May 3, 1893	R. ovary	Cyst (8½ pints) enucleated from broad ligament
11	H.	41	5	1	In Sept., 1892, before pregnancy; confined June, 1893	R. ovary	Multilocular cyst (6 pints, 4 ozs. bloody fluid); pedicle twisted
12	H.	28	1	0	Immediately after labour, 3 months before ovariectomy	Both ovaries	Suppurating cyst (26 ozs., foetid pus on R. side); left cyst not suppurating
13	S.	30	4	0	After confinement (Dec. 1892) noticed swelling which proved to be tumour 1 month before admission	R. ovary	Multilocular cyst (11 pints, 6 ozs.) papilloma inside
14	G.	35	6	1	Confined 8 months; noticed pain after 5 months	R. ovary	Dermoid 11 × 10 × 7 cm.; pedicle had been twisted
15	H.	28	0	0	3 weeks before admission, during pregnancy (contracted pelvis)	L. ovary	Multilocular cyst, size of uterus at 5 months; pedicle twisted
16	A.	27	0	0	In 3rd month of pregnancy; tapped by doctor a fortnight after delivery at term (Aug. 10, 1895), 10 pints removed	R. ovary	Multilocular cyst, size of adult head, strong adhesions about puncture
17	G.	29	3	0	Swelling noticed after last confinement (May 28, 1895), inflammation 3 months later	Both ovaries	R. multilocular cyst, size of uterus at term, L. size of adult head; pedicle twisted
18	S.	30	7	0	During pregnancy (contracted pelvis)	R. ovary	Unilocular cyst, size of Tangerine orange
19	W.	30	0	0	By me before pregnancy (contracted pelvis)	Both ovaries	Dermoids: R. 10.5 × 7.5 × 6 cm., L. 8.5 × 7.5 × 6 cm.
20	P.	26	2	2	Soon after abortion (May 21, 1896) ...	R. ovary	Dermoid, size of double fist
21	G.	20	1 (dead June 1, 1896)	0	After delivery (June 1, 1896); by me during labour (July 10, 1897), when ovariectomy performed	R. ovary	Dermoid 11 × 10 × 9 cm. ...
22	G.	35	4	—	6 weeks after delivery; child living	R. ovary	Multilocular cyst; pedicle twisted
23	D.	32	3 2 still-born, the last on May 17, living	—	By me during labour (May 17, 1897); tumour incarcerated in pelvis, cord prolapsed; foetal pulse 30; tumour pushed up, forceps. Child living. Tumour present at first labour	L. ovary	Dermoid 10 × 8.5 × 7 cm.; pedicle twisted



*Labour, and the Puerperium—Table of Ovariectomies.*

Result of labour to		Growth of tumour during pregnancy or puerperium.	Date of ovariectomy.	Adhesions.	Result.
Mother.	Child.				
Recovered; high fever; extreme emaciation	(?) Living ...	Apparently slow before and during pregnancy; marked after delivery	12/x/1891	All around tumour	R
Recovered well; highest T. 99.6	Living (forceps); girl	Probably slow during pregnancy; stationary during puerperium	30/x/1891	No ...	R
Recovered well ...	Living twins (both vertex)	Probably slow... ..	16/ii/1892 (at 14th week of pregnancy)	Abdominal wall and omentum	R
Recovered ...	Died 3rd day (forceps)	Steady increase after labour	10/iii/1892	Universal ...	R
Recovered ...	(?) Living ...	Grew no larger, but harder since noticed	27/iii/1892	Abdominal wall, omentum and intestine	R
Recovered well ...	Living (difficult—forceps)	Very slight after labour ...	19/iv/1892	No ...	R
Recovered; up 10th day; pain after month	Living (vertex) ...	<i>Diminished</i> greatly while under observation for pleurisy for 10 weeks before operation	4/vi/1892	Intestine, omentum and abdominal wall	R
Recovered (high fever)	Living ...	Not known ...	31/i/1893	Abdominal wall and omentum	R
Constantly ill after labour	Died; 32 hours (cross-birth, version)	Apparently no increase during or after pregnancy	15/iv/1893	No ...	R
Recovered ...	Living (breech) ...	Slow before and during pregnancy, rather rapid in 4 months following labour	9/ix/1893	Abdominal wall and pelvis	R
Recovered; fever and rigor; peritonitis	Living (normal delivery)	No increase during pregnancy; growth rapid after first fortnight of puerperium	3/ii/1894	Omentum...	R
Bedridden; could not move legs for 4 weeks; fever	Dead (forceps) ...	No increase since delivery ...	29/xii/1894	Abdominal wall ...	R
Recovered well; got up 11th day	Living (natural delivery)	Gradual slow increase after labour	21/v/1895	No ...	R
Recovered well ...	Living (vertex) ...	Probably little if any increase	29/vi/1895	No ...	D
Recovered well ...	Living (labour induced; vertex; forceps)	Not known; attention first called to it by peritonitis, which it set up 5 weeks ago	23/x/1895 (at 11th week of pregnancy)	Intestine, omentum and abdominal wall	R
Recovered well ...	Living; girl; vertex	Gradual during pregnancy and puerperium	18/i/1896	To abdominal wall and omentum	R
Recovered well ...	Living; rapid vertex delivery	Gradual after labour ...	2/iii/1896	No ...	R
Recovered well ...	Living (1st vertex) labour induced	No growth during several weeks' observation	20/vi/1896 (at 11th week of pregnancy)	No ...	R
Recovered well ...	Aborted ...	L. tumour size of hen's egg, 3 months before	12/vii/1896 (at 12th week of pregnancy)	No ...	R
Recovered well ...	Aborted ...	—	7/xii/1896	No ...	R
Recovered ...	Living; vertex ...	Very slow, if any, increase after abortion. Probably no	10/vii/1897 (during labour)	Slight to left side of retro-uterine pouch	R
Recovered ...	Living ...	—	10/xi/1897	No ...	R
Recovered ...	Living ...	No ...	9/xii/1897	To rectum and posterior pelvic wall	R



TABLE D.—

Case.	Initial.	Age.	Children.	Abortion.	Time of discovery of tumour.	Seat of tumour.	Nature of tumour.
24	M.	30	9	0	By me during pregnancy, in pelvis; pushed up at 4½ months, normal delivery at term (Mar. 6, 1898)	L. ovary	Dermoid 12 × 9 × 6 cm.; pedicle twisted
25	U.	22	2 (living)	0	At last labour, 16 months previously	R. ovary	Dermoid 9 × 7.5 × 5 cm. ...
26	L.	23	1 (Aug. 6, 1899)	0	By me on Sept. 15, 1899 ... ..	L. ovary	Suppurating ovarian cyst, size of duck's egg
27	O.	39	10	—	Immediately after labour (Dec., 1899), probably had existed long before	L. ovary	Cyst, reaching 10½ ins. above pubes
28	W.	27	2	1	Pain since first child (?) 2 years ago; married 7 years	L. ovary	L. suppurating cyst; R. ovarian abscess, pyosalpinx
29	T.	22	2 (last still-born)	2 (before last child)	A month after child-birth when she had attack of peritonitis and ovariectomy was performed	L. ovary	Dermoid, size of emu's egg; pedicle twisted
30	B.	43	2	1	(?) June, 1895, after labour; patient had had delirium tremens, had taken half-pint of whiskey daily for 10 years	Both ovaries	Large L. multilocular cyst; cystic R. ovary
31	R.	23	1 (8 months ago)	—	2 or 3 months before operation ...	L. ovary	Multilocular cyst, size of cocoanut
32	A.	32	3	0	Probably before second pregnancy; present during third pregnancy (normal delivery)	R. ovary	Ruptured multilocular cyst
33	F.	30	4 (last in July, 1901)	1 (before last pregnancy)	Early during present pregnancy, but three attacks of pain during the last year	R. ovary	Ovarian cyst; twisted pedicle
34	L.	31	2 (both living)	0	At birth of first child 4½ years before	L. ovary	Large multilocular cyst (over 22 pints)
35	K.	32	4 (all living)	1	6 weeks after labour (Aug. 13, 1902), attended by nurse; tumour present during pregnancy	L. ovary	Multilocular cyst, size of cocoanut; pedicle twisted
36	T.	25	2	4	After abortion ... ..	R. ovary	Multilocular cyst (7.5 × 6 × 5 cm.), with hydrosalpinx
37	G.	38	0	0	Before pregnancy; diagnosed as uterine fibroid	L. ovary	Calcified ovarian fibroid (13.5 × 12 × 9 cm.), weight 1 lb. 8 ozs., incarcerated in pelvis
38	G.	24	0	0	Early in present pregnancy ... ..	L. ovary	Dermoid (10 × 9 × 7 cm.), weight 10½ ozs.; a right ovarian dermoid removed 13 years before
39	H.	24	0	0	During pregnancy at Lying-in Hospital (tapped!); during labour at University College Hospital	L. ovary	Multilocular cyst (14 pints), ruptured
40	D.	26	0	0	Early in this pregnancy ... ..	Both ovaries	Bilateral ovarian fibroids R. 3 lb. 8 ozs. (18 × 15 × 11 cm.) L. (2.5 × 2.25 × 2 cm.), enucleated
41	C.	21	0	0	Early in this pregnancy ... ..	R. ovary	Dermoid (9 × 6 × 4.5 cm.) ...
42	S.	37	3	1 (at 4th mo. before last child)	Since last pregnancy 7 years ago ...	Both ovaries	L. Multilocular dermoid size of adult head, pedicle twisted; R. ovary simple cyst size of hen's egg
43	W.	36	4 (14, 11, 8, 6 years ago)	1 (at 4th mo. 15 mos. ago)	During this pregnancy uterus retroverted and prolapsed, bleeding occurred	R. ovary	R. multilocular cyst filling abdomen
44	S.	42	10	2	At last labour ... ..	L. ovary	L. ovarian dermoid, size of 6 months uterus, pill-like contents; part of ovary left behind



*continued.*

Result of labour to		Growth of tumour during pregnancy or puerperium.	Date of ovariectomy.	Adhesions.	Result.
Mother.	Child.				
Recovered ... ..	Living ... ..	No ... ..	21/iii/1898	No ... ..	R
Recovered (labour Oct. 29, 1898)	Living ... ..	None, or very slow ... ..	30/v/1898 (at 18th week of pregnancy)	No ... ..	R
Recovered ... ..	Living ... ..	Continuous fever till operation	7/xi/1899	Uterus, omentum, intestine, broad ligament, pelvic wall	R
Recovered ... ..	—	—	5/iv/1900	To omentum ...	R
Recovered ... ..	(?) Living ... ..	—	5/vi/1900	Uterus, pelvis and broad ligament	R
Recovered ... ..	Living ... ..	Probably no ... ..	29/vii/1900	To all parts around	R
Recovered ... ..	—	—	17/xi/1900	To abdominal wall and broad ligament	R
Recovered ... ..	(?) Living ... ..	—	29/i/1901	Abdominal wall and broad ligament	R
Recovered ... ..	Living ... ..	Rather rapid increase during last pregnancy	4/iii/1902	Abdominal wall and omentum	R
Recovered (labour, forceps, April 24, 1903)	Living; soon died	No ... ..	23/x/1902 (at 15th week of pregnancy)	To omentum, bladder and intestine	R
Recovered (labour, Oct. 28, 1902)	Living ... ..	—	3/xii/1902	No ... ..	R
Recovered ... ..	Living ... ..	—	14/ii/1903	To all parts around	R
Recovered ... ..	Abortion ... ..	Probably no ... ..	7/vi/1903	No ... ..	R
Recovered ... ..	Living ... ..	No ... ..	28/xi/1903 (immediately after Cæsarean section)	No ... ..	R
Recovered (labour, Dec. 13, 1905)	Living ... ..	No ... ..	13/vii/1905 (at 18th week of pregnancy)	No ... ..	R
Recovered ... ..	Living ... ..	Filled up rapidly after tapping	10/viii/1905 (during labour)	Omentum and abdominal wall	R
Recovered (subsequently had living child, Sept., 1907)	Aborted ... ..	Probably no ... ..	17/iii/1906 (at 5th week of pregnancy)	No ... ..	R
Recovered (labour, Aug. 7, 1908)	Living ... ..	No ... ..	10/iii/1908 (at 10th week of pregnancy)	No ... ..	R
Recovered ... ..	—	Slow increase in size during 7 years	14/xi/1908	No ... ..	R
Recovered ... ..	Aborted July 7 (mole),	Apparently rapid increase during this pregnancy	10/vi/1909 (at 13th week of pregnancy)	No ... ..	R
Recovered ... ..	Living ... ..	Rather rapid increase lately	30/iv/1910	To omentum all over cyst	R



TABLE D.—

Case.	Initial.	Age.	Children.	Abortion.	Time of discovery of tumour.	Seat of tumour.	Nature of tumour.
45	B.	29	1	1	After abortion at 10th week; 7 weeks before operation	R. ovary	R. ovarian fibroid (4.5 × 3.2 × 2.5 cm.), covered with lymph, suppurating
46	K.	25	3	—	On Nov. 20, 1910; patient delivered Oct. 23, 1910	R. par-ovarium	R. parovarian cyst (9 × 8.7 × 6.2 cm.), excised; neither ovary removed
47	J.	35	1	1 (at 6th week 13 mos. before child)	At 13th week of this pregnancy	R. par-ovarium	R. parovarian cyst, size of emu's egg, full of blood; pedicle twisted
48	L.	30	3 (last labour Dec. 31, 1911, very difficult, in Lying-in Hospital)	0	4 months after delivery, probably present then; occipito-posterior presentation; forceps	R. par-ovarium	R. parovarian cyst (6.8 × 5.6 × 5 cm.), inguinal hernia operated on through abdominal incision; perineorrhaphy. Neither ovary removed
49	R.	22	1	0	During pregnancy; patient constipated for a week; T. 99.6, P. 140, before operation	R. ovary	Large papillomatous ovarian 2 ins. above umbilicus; twisted pedicle
50	C.	29	3	—	After child-birth, April 1913, tumour in pelvis; forceps tried; turning	R. par-ovarium	R. bilocular parovarian cyst, size of double fist, enucleated; neither ovary removed
51	W.	36	0	1 (2nd mo., 1 mo. before operation)	At time of abortion	L. par-ovarium R. ovary	L. sub-fimbrial cyst, size of hen's egg; R. ovarian cyst, size of small lemon, pedicle twisted; L. ovary not removed
52	S.	24	1	—	16 days after normal labour, fever and anæmia, but general condition good	L. ovary	Unilocular ovarian, pedicle twisted
53	D.	33	1	0	During pregnancy; delivered Feb. 4, 1914	R. ovary	Dermoid (16 × 10 × 8.7 cm.), a small papillary growth also excised from surface of ovary
54	C.	30	3	0	During labour (2½ hours) 10 P.M., Jan. 28, 1915	L. ovary	Large multilocular cyst, 2 galls. bloody contents, ruptured, removed 12 hrs. after delivery
55	C.	32	5	2	1 month after delivery; (tapped by doctor)	L. ovary	Large multilocular cyst, with tarry contents

preceding the ovariectomy, the rate would be 10 per cent. In five out of six cases in which both ovaries were affected abortion did not occur; in the sixth case (Case 30) it is doubtful.

*Number of Abortions in 15 Cases Operated on During Pregnancy.*

Four of the cases aborted (26.6 per cent.).

Case 19 had bilateral dermoids removed at the twelfth week; Case 40 bilateral fibroids removed at the fifth week of pregnancy; Case 43 had hæmorrhage before the operation at the thirteenth week, when a large multilocular cyst was removed; the patient passed a

*continued.*

Result of labour to		Growth of tumour during pregnancy or puerperium.	Date of ovariectomy.	Adhesions.	Result.
Mother.	Child.				
Recovered ...	Aborted ...	Not noticed ...	9/viii/1910	No ...	R
Recovered ...	(?) Living ...	—	4/ii/1911	No ...	R
Recovered ...	Aborted, April 7, 1911	Not noticed; operated on 2 hrs. after twisting of pedicle; blood in broad ligament; R. ovary also removed	26/iii/1911 (at 13th week of pregnancy)	No ...	R
Recovered ...	Living, 9 lbs. 12 ozs. (forceps)	—	1/vi/1912	No ...	R
Recovered ...	Living, 8 lbs. 11½ ozs., May 8, 1913	—	31/x/1912 (at 11th week of pregnancy)	To abdominal wall and omentum	R
Recovered ...	Dead born ...	2 years ago 11 lb. child delivered without instruments	19/vi/1913	No ...	R
Recovered ...	Abortion ...	—	16/x/1913	No ...	R
Recovered ...	Living ...	Tumour not noticed till found by doctors on 16th day	6/xi/1913	Strong to sigmoid, uterus, bladder, and abdominal wall	R
Recovered ...	Living ...	Tumour size of hen's egg at 3rd month of pregnancy	7/v/1914	No ...	R
Recovered ...	Living ...	Sudden rapid growth a month ago	29/i/1915	No ...	R
Recovered ...	Living ...	Not noticed during pregnancy; rapid growth after labour	27/ix/1917	No ...	R

mole 27 days afterwards. Case 47 had an acute twist of the pedicle of a parovarian cyst with hæmorrhage into the broad ligament; the tumour was removed at the thirteenth week of pregnancy two hours after the twist occurred.

In nine of the 15 cases operated on (60 per cent.) the pregnancy continued and living children were born.

As three of the patients were operated on at term, when the question of abortion does not arise, the true abortion rate for patients operated on before the child is viable is in this series four out of 12 cases (33·3 per cent.).



*Nature and Condition of the Tumours.*

All the tumours were benign.

*Cyst-adenomatous* tumours were found in 33 cases (60 per cent.), of these 22 were multilocular (in two cases papillomatous) and 11 unilocular; some of the latter may originally have been multilocular. The cystadenomatous tumours were mostly of large size; a few were small. The three ruptured tumours (Cases 32, 39 and 54) were multilocular cysts of large size. The two papillomatous tumours (Cases 13, 49) were also multilocular. Case 36 was complicated with hydrosalpinx and Case 28 with pyosalpinx and ovarian abscess.

*Dermoid Tumours* were found in 15 cases (27·2 per cent.).

They were mostly small, not more than 10 to 12 cm. in their greatest diameter, the exceptions being Case 4 (which contained 3 pints of pus), Case 42 (which was as big as an adult head), Case 53 (which measured 16 cm. in its longest diameter), and Case 44 (which was as big as the pregnant uterus at the sixth month, and contained pill-like balls of fat). In two of the cases the tumours were removed on both sides and in Case 38 a dermoid had been removed from the opposite side 13 years previously. Thus 20 per cent. of the dermoids were bilateral.

*Ovarian Fibroids* were found in three cases (5·4 per cent.): in Case 45 the tumour was small; in Case 37 it was calcified, weighed 1 lb. 8 oz., blocked the pelvis and was mistaken for a uterine fibroid before the operation; in Case 40 the tumours were bilateral, the right tumour weighed 3 lb. 8 oz. and was removed with the rest of the ovary; the left, an inch in diameter, was excised and the remains of the ovary stitched up. The patient had a living child next year (see 'Proc. Roy. Soc. Med.,' Obs. and Gyn. Section, Vol. II, p. 231).

"*Parovarian*" *Tumours* were found in six cases (10·9 per cent.). All except Case 2 (which contained 10 pints) were of small size. In Case 51 a sub-fimbrial cyst on the left side was associated with an ovarian cyst on the right. In only one case (the only case in which the pedicle was twisted) was the corresponding ovary removed.

*Torsion of the pedicle* occurred in 18 cases (32·7 per cent.):—

- 12 times in cystadenomatous tumours (36·3 per cent.);
- 5 times in dermoid tumours (33·3 per cent.); and
- Once in "parovarian" tumours (16·6 per cent.).



*Rupture of the tumour* occurred in three cases (5·4 per cent.): Case 32 was ruptured, probably at labour, and removed a month later; Case 39 had been tapped at a lying-in hospital to relieve pressure; the tumour was removed during labour; Case 54 was admitted during labour with much free fluid in the abdomen: the diagnosis was made of ruptured ovarian cyst; it was removed 12 hours after labour and was found to be ruptured, but held 2 gallons of bloody fluid, some of which had escaped into the peritoneum.

All these tumours were very large multilocular cysts. The largest ruptured ovarian tumour I have met with contained 31 pints of fluid. It burst on the third day after an easy labour. The patient had been advised, both before and during pregnancy, to have the tumour removed, but refused. She had been progressing favourably but became collapsed when the cyst ruptured and was removed in an ambulance to hospital, but died of syncope immediately after her admission.\* The wall of the cyst was very thin and looked as if it had been stretched.

*Suppuration of the tumour* was met with in eight cases (14·5 per cent.).

In all cases the suppuration occurred after delivery.

In Case 1 the tumour contained 2 gallons of foetid pus and the patient was very emaciated and feverish.

In Case 4 the patient had been delivered with forceps (the child dying on the third day) and the tumour had been tapped twice, 10 pints of pus being evacuated.

In Case 7 the pedicle was twisted. In Case 8 the tumour contained 15 pints of pus. In Case 12 the child was delivered (dead) with forceps; the tumour contained 26 oz. of pus. In Case 26 the tumour was small and did not become evident till the uterus had involuted. Case 28 was complicated with an ovarian abscess and pyosalpinx on the other side.

Six of the suppurating tumours were cystadenomatous, one was a fibroid, one (Case 4) was a dermoid; the infection in this case probably was caused by the tapping. The supposed proneness of dermoids to suppurate is due to an error of observation; the liquid fat at the temperature of the body looks very like pus to the naked eye. Examination with the microscope shows its nature. The fact is that dermoids very rarely suppurate. They are no doubt more prone to

\* 'Obstet. Soc. Trans.,' vol. xliii, p. 224.



it as a result of labour, owing to the risk of injury when they are in the pelvis. Out of 59 dermoid tumours removed I have only met with suppuration in two cases besides the case mentioned above, and in one of them the tumour communicated with the sigmoid flexure of the colon; the other was published in the 'Med. Soc. Transactions,' Vol. XVII.

*Seat and Position of the Tumour.*

The tumour was situated in the right ovary in 23 cases, in the left ovary in 18 cases, in both ovaries in eight cases, in the right parovarium in four cases, in the left parovarium in one case, in the left parovarium and in the right ovary in one case.

*Incarceration of the tumour in the pelvis* was met with in five cases\* (Cases 21, 23, 24, 25, 37).

In Case 21, a dead child had been delivered by forceps a year previously. As the tumour could not be pushed up during labour, ovariectomy was performed, the uterus being withdrawn from the abdomen, in order to permit extraction and removal of the tumour; the forceps was then applied while the uterus was outside the abdomen, and a living girl delivered who was quite well 21 years later; the mother had had nine children since the ovariectomy, and was also in good health.

In Case 23, the tumour was pushed up during labour, the child delivered alive by forceps, and the tumour removed seven months later.

In Case 24, the tumour, incarcerated in the pelvis at  $4\frac{1}{2}$  months, was pushed up, and a living child was born at term; the tumour was removed a fortnight after delivery. After the tumour had been pushed up, it occupied a position in the loin, and at term closely resembled a hydronephrosis, and might easily have been overlooked. A photograph taken at term shows little evidence of the tumour, and emphasises the importance of examination of the lumbar regions during pregnancy.

In Case 25, the tumour was removed at the 18th week of pregnancy, and a living child was born at term.

In Case 37, in which the tumour was mistaken for a *uterine*

\* The first four cases have been published in 'Obstet. Soc. Trans.,' vol. xl, pp. 14, 22, 259, 329; the fifth in 'Proc. Roy. Soc. Med.,' Obstet. and Gyn. Section, vol. ii, p. 232.



fibroid, Cæsarean Section was performed, with a successful result to the mother and child.

These five cases, of which four were dermoids, show the value of treating the obstructing tumour either by pushing it up out of the pelvis or removing it by operation. The danger of delivering the child while an ovarian tumour is in the pelvis is illustrated by a specimen exhibited before the Obstetrical Society in 1898, which was ruptured during version after an attempt at delivery by forceps, with a fatal result to the mother.\*

During the course of labour, the reposition of the tumour is facilitated by putting the patient in the Trendelenburg position under chloroform anæsthesia (Bossi)†; a procedure which should always be tried before resorting to abdominal section.

If it is found to be impossible to push up the tumour, the uterus should be withdrawn from the abdomen through a 6-inch incision, which is quite long enough if the uterus be brought out cornerwise. If the child be in good condition the tumours may be removed, and the child delivered by forceps; but, if the child's heart-sounds are slowed or weak, the child should be delivered as soon as the tumour has been pulled out of the pelvis and before it is removed; thus the child will be spared some minutes of anæsthesia. It is of great importance that the cervical canal should be dilated before operation for the removal of the tumour, otherwise it may be necessary, after removing the tumour, to close the abdomen, which is done with difficulty, owing to the tension of the abdominal wall. In delivering the child at the end of the first stage, it is not necessary to replace the uterus in the abdomen; the forceps may be applied (if possible, by a second operator), while the uterus lies on the abdominal wall (Case 21). If the cervical canal is not dilated, the tumour should be pushed up with the patient in the Trendelenburg position, and the tumour removed at a later stage of labour or after delivery.

#### *Adhesions of the Tumour.*

Adhesions were found in 26 cases (47·2 per cent.).

The adhesions were all around the tumour in four, to the abdominal wall in fourteen, to the omentum in thirteen, to intestine

\* 'Obstet. Soc. Trans.,' vol. xl, p. 331.

† 'La Gynécologie,' 1900.



in seven, to the pelvis in five, to the broad ligament in four, to the uterus in three, to the bladder in two cases.

All the suppurating cases were adherent. Six of the 18 tumours with twisted pedicle had adhesions (33·3 per cent.). Case 10 had a large cyst (8½ pints); Case 16 had been tapped; Case 21 had been delivered of a dead child, and the tumour was probably bruised. Cases 27 and 30 also had large cysts, while in Case 31 the tumour was as big as a cocoanut. In Cases 32 and 39 the cyst was ruptured. Case 44 had a large dermoid. Dermoid tumours, with pedicles not twisted, were free from adhesions except in two cases (21, 44).

*Growth of the Tumour during Pregnancy or Puerperium.*

There does not appear to be any evidence in these cases of specially rapid growth of the tumour during pregnancy. Fifteen (27·2 per cent.) of the tumours were dermoids, which usually grow slowly, and do not attain a size which enables the growth to be easily observed, at least by the patient. In Case 19, the left-side dermoid grew in three months from the (estimated) size of a hen's egg to a size of 8·5 × 7·5 × 6 cm.; in Case 53, the dermoid tumour at the third month of pregnancy of the size of a hen's egg measured 16 × 10 × 8·7 cm. nine months later. It must be remembered that the growth of ovarian tumours, apart from pregnancy, is often rapid. In Case 54, the growth was sudden and rapid, and the cyst ruptured during labour; it contained 2 gallons of bloody fluid and was removed 12 hours after delivery. In Case 39, the tumour grew so fast that it had been tapped in a lying-in hospital to relieve pressure. These cases of rapid growth are, however, exceptional, and, on the whole, it appears that pregnancy exercises no special influence in increasing the rate of growth, the evidence pointing usually in the opposite direction.

In the puerperium, there seems to be a greater tendency to a rapid growth. Case 7 is especially interesting from the fact that the tumour *diminished* greatly during 10 weeks' observation in the hospital; the patient was also suffering from pleural effusion, of tubercular origin. A large suppurating ovarian cyst, extending high up into the abdomen, gradually got smaller, until, at the time of its removal, it was of the size of a fist. At the operation, adhesions to the omentum, abdominal wall, and intestines were found to encapsule the tumour, and no doubt the vessels in these



adhesions had absorbed some of the fluid in the cyst, thus leading to the remarkable reduction in size. The patient recovered well from the operation, and slowly recovered from the pulmonary phthisis, and was examined by me, and found to be in fairly good health 27 years later.

*Result of the 55 Ovariectomies.*

One patient died from the ovariectomy (Case 14). The tumour was a dermoid. The patient had been delivered eight months before the operation. She had noticed abdominal pain five months after the confinement. There were no adhesions. The pedicle was not twisted at the time of the operation, but the Fallopian tube was almost divided, possibly as the result of a twist which had become undone. After the operation, intestinal obstruction was caused by the adhesion of a coil of small intestine to the stump of the ovariectomy pedicle. The abdomen was opened and the coil separated, but the patient succumbed.

*Result of the 15 Ovariectomies Performed during Pregnancy.*

Twelve of the cases were operated on in the first half of pregnancy, viz., at the 14th, 11th, 11th, 12th, 18th, 15th, 18th, 5th, 10th, 13th, 13th, 11th week. Cases 21\* and 39† were operated on during labour; Case 37,‡ immediately after Cæsarean Section at term. In Cases 15 and 18, labour was induced on account of contracted pelvis.

All the mothers recovered.

The children (in Case 3 twins) were born alive in 11 cases, but in Case 33 the child died soon after birth; four patients aborted; thus, in five out of 15 cases, the child was lost; mortality rate for the children, 33·3 per cent.; the abortion rate, 26·6 per cent., or, more correctly, 33·3 per cent. (see *ante*).

*Result in Four other Cases seen by the Author during Pregnancy,  
Operated on after Delivery.*

Case 2 was seen in labour; a unilocular cyst containing 10 pints was present. The patient was delivered with forceps and made a good recovery; the tumour was removed eight months later.

\* 'Obstet. Soc. Trans.,' vol. xl, p. 14.

† 'Obstet. Soc. Trans.,' vol. xlviii, p. 37.

‡ 'Proc. Roy. Soc. Med.,' Obstet. and Gyn. Section, vol. ii, p. 232.



In Case 23, the tumour was incarcerated in the pelvis during labour, the cord prolapsed, the foetal pulse-rate was 30; the tumour was pushed up out of the pelvis and the child delivered alive with forceps. The tumour was removed eight months later.\*

In Case 24 the tumour was incarcerated in the pelvis and was pushed up into the abdomen at  $4\frac{1}{2}$  months; during the second half of the pregnancy the tumour caused no trouble. A living child was born at term, and the tumour was removed 15 days later.† Of Case 54 the particulars have been given under the heading "Rupture of the Tumour."

In these four cases the mothers recovered and the children survived.

Thus, of the 19 cases seen by the author during pregnancy, all the mothers recovered; and in 15 the children were born alive and in 14 survived, the mortality rate of the children being 26·3 per cent., the abortion rate 21·5 per cent.

*Result of the Pregnancies in the 40 cases not operated on during Pregnancy.*

All the mothers recovered from the labour or abortion. In 29 cases (out of 37 in which the fate of the child is given) the child was born alive; in four cases the child died as a result of difficult delivery by forceps or version (Cases 4, 9, 12, 50). In four (possibly in five) out of the 40 cases abortion occurred (Cases 20, 36, 45, 51). The mortality rate for the children is eight out of 37 = 21·6 per cent. The abortion rate is 10 per cent. or possibly 12·5 per cent. (see *ante*).

*The Ovariectomy.*

The ovariectomy incision was made in or near the middle line, usually through the inner edge of the left rectus muscle. In Cases 46 and 51 the transverse Pfannenstiel incision was made: this incision lessens the exposure of the intestines and the risk of hernia subsequently, but may entail more manipulation; it is only exceptionally suitable for cases operated on during pregnancy.

Silk was used exclusively for ligatures and buried sutures.

Drainage was employed in three cases (Cases 10, 26, 30).

The pedicle was tied with interlocking silk ligatures and stitched

\* 'Obstet. Soc. Trans.,' vol. xl, p. 22.

† 'Obstet. Soc. Trans.,' vol. xl, p. 259.



over with fine silk. In the later cases, isolated ligatures were also placed on the ovarian artery as first practised by Burd in 1846.\* The advisability of this practice is shown by Laroyenne's case,† in which a patient died in the second month of pregnancy from hæmorrhage from slipping of the ordinary ligature applied at an ovariectomy three months previously; at the autopsy the two ends of the artery were found gaping, the growing uterus having displaced the ligature by stretching the broad ligament. Fehling‡ also lost a patient from the same cause; the labour pains, which began on the day following an abdominal ovariectomy near term, after two hours caused the ligature to slip and led to intraperitoneal hæmorrhage, for which the abdomen was opened and the pedicle again tied, but too late to save the patient.

### *Ætiology.*

The question of the influence of pregnancy in causing malignant changes in ovarian tumours has been discussed by Sir John Williams in his Cavendish Lecture. He showed that there was no evidence of such influence. In support of this opinion is the fact that malignant ovarian tumours are rarely found in pregnancy; in my 55 cases there was not an instance, whereas, apart from pregnancy, malignancy is met with in more than 20 per cent. of ovarian tumours. It is noteworthy that in advanced age, in women over 70 years of age, malignant ovarian tumours are also rare. What the cause of this rarity is cannot at present be stated.

Sir John Williams also discussed the influence of pregnancy and sterility in the causation of ovarian tumours, and came to the conclusion that sterility favours their production. The question is admittedly difficult to decide from consideration of the material available. In comparing Spencer Wells's figures of ovariectomy with the figures of the 1891 Census Report, Sir John Williams assumes that the married women were mothers and the single not mothers, while pointing out that the assumption may not be quite accurate. As married women who are childless are much commoner than single women who are mothers, I think his conclusion as to the effect of sterility in causing ovarian tumours may not be justified.

The only evidence I can offer on this interesting subject is too

\* 'Med. Chir. Trans.,' vol. xxx, p. 98 (1847).

† 'Congrès périod. internat. de gynéc. et d'obstet.,' Genève (1896), 1897, ii, p. 125.

‡ Quoted by Criwitz, "Geburtshindernis durch Ovarialtumoren," 'Inaug. Diss.,' 1902.



small to be of much value. Of eight cases of ovariectomy which I have performed on women over 70 years of age, seven were married and had been pregnant, and one was a virgin. The Registrar-General's Report for 1891 shows the proportion of married to single, in those over 65, to be about 89 to 11, and, if we allow one childless marriage in ten, the proportion of pregnant women to sterile would correspond so closely with the proportion in my cases as to suggest that sterility has not the influence which Sir John Williams's statistical investigations of Spencer Wells's cases would seem to show. But I think the question cannot be answered until we know the frequency of ovarian tumours in large numbers of virgins.

### *Symptoms.*

Many patients go through pregnancy without any symptoms arising from the presence of an ovarian tumour, if it is small and does not block the pelvis or become twisted or inflamed. The only way in which such tumours can be diagnosed is by routine examination of the abdomen and pelvis during pregnancy which ought to be carried out in every case. In advanced pregnancy it is important to examine the lumbar regions, as small tumours may easily escape notice or may be mistaken for renal tumours.

Tumours which are large give rise to feelings of weight and pressure.

When the tumour becomes inflamed or strangulated by twisting of its pedicle the symptoms are acute and may closely simulate strangulation or necrobiosis of a fibroid, acute appendicitis, or pyonephrosis. The symptoms of rupture will depend upon the nature of the contents; in some cases the accident scarcely gives rise to any other effect than alteration in the shape of the abdomen from the peritoneal effusion; in others shock, pain and vomiting ensue. Malignant tumours are fortunately rare; they may cause emaciation and cachexia and are usually painful, though in some cases there are no symptoms which suggest malignant disease.

### *Diagnosis.*

The diagnosis of pregnancy complicated with ovarian tumour is usually not difficult. In some cases of early pregnancy where the ovarian tumour is large or adherent it may be difficult to make out the shape and consistence of the uterus. But in all cases where



menstruation is delayed pregnancy should be suspected, and the colour of the vagina, the consistence of the uterus, and the appearance of the breasts should be investigated; the presence of morning vomiting may help in the diagnosis. In the early months the increased width of the uterus may be made out by examining the patient bimanually in the dorsal position with the fore and middle fingers of the right hand on each side of the cervix. In conducting this examination the greatest gentleness should be used; any forcible pressure may easily separate the ovum, an objection which applies to the so-called "Hegar's sign." In the second half of pregnancy the "certain signs" (heart-sounds, parts or movements of the child and ballottement) the contraction of the uterus and the breast changes usually render the diagnosis of pregnancy easy, if care is employed; but hydramnios may render the detection of the foetus difficult even when the patient is placed in the kneeling position which, causing the foetus to fall to the most dependent part of the abdomen, renders its detection by ballottement easier. It is important to bear in mind the softness of the supra-vaginal cervix—the physical condition which enables Hegar's sign to be obtained—which may cause the body to be apparently separate from the cervix and may, therefore, be mistaken for an ovarian tumour. Occasionally a lop-sided pregnant uterus is met with, which I have known taken for an extra-uterine tumour. If the uterus is very thin-walled—and sometimes it feels as thin as an ovarian cyst—the body, or a bulging portion of it, may be mistaken for an ovarian cyst if careless examination is made. Error is avoided by careful bimanual examination in the dorsal position, when under gentle manipulation the uterus will be felt to contract, to become one with the cervix and regular in shape.

In some cases of ectopic pregnancy a doubt may exist as to whether the enlarged uterus is pregnant or not and the tubal swelling is a mole, a hæmatocele, or an ovarian cyst; but the hæmorrhage which usually occurs in these cases will lead to an exploration of the uterus which is found to be unimpregnated. The rare co-existence of intra-uterine and extra-uterine pregnancy must be borne in mind.

The recognition of the ovarian tumour is usually easy, as it ordinarily forms a cystic tumour movable apart from the uterus, on a pedicle which can sometimes be detected under anæsthesia. If the tumour is small it may easily escape notice in the lumbar region



or may be mistaken for a tumour of the kidney or gall-bladder. Examination under anæsthesia facilitates the diagnosis in these cases. If the tumour is twisted and inflamed it sometimes closely simulates a necrobiotic or strangulated uterine fibroid. Under an anæsthetic its cystic character can usually be made out. Tumours of small size impacted in the pelvis often feel as hard as uterine fibroids, for which they may be mistaken. Rectal examination is of great value in these cases. It must be remembered that uterine fibroids may be as cystic as ovarian tumours, and, on the other hand, ovarian tumours may be solid and are often associated with hydroperitoneum which is rarely found with uterine fibroids. In some cases the diagnosis cannot be made between these two conditions with certainty, though in a patient under 25 a uterine tumour is very unlikely to occur.

If the tumour be ruptured the symptoms will depend upon the nature of its contents. In some cases the accident is followed by few symptoms; in others, shock, pain, vomiting, and peritonitis rapidly ensue. If the tumour be multilocular the unruptured portion of the cyst can be felt, and there are signs of free fluid in the abdomen. If the cyst be unilocular the only sign is the presence of free fluid in the peritoneum which should always be suspected to be due to a ruptured cyst if there are no renal, hepatic, or cardiac causes present.

Suppuration of ovarian cysts is indicated by high fever, wasting, tenderness, and occasionally tympanites; a history of tapping or injury during labour is often obtained.

Twisted tumours usually give rise to local peritonitis, and to fever which usually subsides after a few days; a considerable rise of temperature lasting some days after the acute peritonitis has subsided will usually indicate that suppuration has taken place.

Malignant ovarian tumours are fortunately rare during pregnancy. They are usually solid, bilateral, and associated with hydroperitoneum and wasting; secondary nodules may be felt in the abdomen and in Douglas's pouch.

#### *Treatment.*

The treatment of ovarian tumours apart from pregnancy is generally acknowledged to be removal as soon as practicable.

When pregnancy exists the matter is not so simple: the interests of the child and the desirability of maintaining the fertility of the mother may justify a postponement of the operation. In the intro-



ductory remarks a case was mentioned where this was done. In another patient, from whom a dermoid was removed before the occurrence of pregnancy, the other ovary was found to be cystic, but was not removed, as the patient was childless, with the result that in this case also the patient has since had a living child. Case 38 is another illustration of the value of not removing a dermoid.

On the other hand, in Case 19 the patient, pregnant for the first time, was operated on for bilateral dermoids at the 12th week, aborted, and has of course remained childless. The tumours were causing no trouble and were discovered during an examination on account of sterility a few months previously. Had the operation been postponed, in all probability she would have had a child; as it was, she aborted as a result of the operation.

I should like again to direct attention to the results to the child in this series, according as the operation was performed during pregnancy or after delivery.

In cases operated on the infantile mortality was 33·3 per cent.; the abortion rate, 26·6 (or 33·3 per cent. of the cases operated on in "early pregnancy"). In those *not* operated upon during pregnancy (although sometimes unskilfully treated during labour, the infantile mortality was only 21·6 per cent., and might have been reduced to 10·8 by more skilful treatment during labour; the abortion rate was 10 to 12·5 per cent.

Five at least (possibly all) of the six cases of bilateral ovarian tumours unoperated on during pregnancy did not abort; both the cases of bilateral ovariectomy during pregnancy aborted. From these figures it appears that operation during pregnancy involves an increased risk to the child.

The statistics, based on published cases, in McKerron's classical work, show that the risk of abortion is least in the early months of pregnancy.

Although the risk to the child of operation during pregnancy should be taken in most cases, to prevent the grave consequences which may result to the mother from leaving the tumour till the end of pregnancy, yet in uncomplicated cases of small tumours giving rise to no symptoms in patients who are childless, and particularly when bilateral tumours are present, the operation should be postponed, at least until the child is viable.

The treatment of ovarian tumours complicating pregnancy, labour, and the puerperium has been by some writers considered too much



from a surgical standpoint: the obstetrical aspect is not less important and in some cases, as in No. 23, is the dominant factor. Amongst the 19 cases which I have personally treated during pregnancy there were three cases of contracted pelvis which necessitated induction of premature labour in two of the cases, and would have done so in the third had the patient not aborted. It is clear that a contracted pelvis may profoundly modify our treatment, and that an obstetric examination of the pelvis should be carefully made in every case. Then the existence of bilateral tumours in patients who have not had children may justify the postponement of the operation in the hope of obtaining a living child, and should lead us whenever possible to conserve some part of the ovary (Case 40).

The following scheme of treatment was published in 1909 ('Trans. Amer. Gyn. Soc.'). As I have not seen any reason for modifying it, I reproduce it here with slight verbal alterations.

#### A. DURING THE FIRST HALF OF PREGNANCY.

Ovarian tumours should be removed wherever their situation and whatever their size.

*Exceptions.*—The following tumours should not usually be removed:—

1. Lutein cysts complicating hydatidiform mole; these often subside spontaneously.
2. Bilateral tumours causing no symptoms, if the patient is childless; or, if operated on, part of an ovary should be left behind.
3. Primary adherent malignant cysts.
4. Secondary malignant cysts.

#### B. DURING THE SECOND HALF OF PREGNANCY.

a. All *large* ovarian tumours and ruptured, inflamed, and strangulated tumours should be immediately removed.

b. Small tumours which are in the abdomen or which can be easily pushed up out of the pelvis in the knee-chest or Trendelenburg position should be watched, and if no untoward symptoms arise should be removed either at the end of pregnancy, or towards the end of the first stage of labour or after delivery.

c. Small tumours which are incarcerated in the pelvis and cannot easily be replaced in the abdomen may be watched and removed at the end of pregnancy, or, if circumstances will allow, towards the



end of the first stage of labour. If the tumours are adherent or solid, Cæsarean section should be performed.

In all ovariectomies during pregnancy the vessels of the pedicle should be separately tied; the pedicle should be ligatured as far as possible from the uterus, and morphia should be given for the first two or three days after operation.

#### C. DURING LABOUR.

The best treatment is abdominal ovariectomy, immediate in the case of large tumours, at the end of the first stage or after delivery in the case of small tumours. When the operation is performed at the end of the first stage a second operator may deliver the child by forceps while the tumour is being removed. If the tumour be incarcerated in the pelvis and cannot be pushed up in the Trendelenburg position, the uterus should be withdrawn from the abdomen in order that the tumour may be dealt with.

For solid and adherent tumours occupying the pelvis Cæsarean section may be necessary. It should not be performed for cystic non-adherent tumours. When labour is advanced and a cystic tumour is impacted in the pelvis, the circumstances may render it advisable to deliver the patient by the natural passages after evacuating the contents of the tumour by incision and packing the cyst with gauze; but the tumour should, if practicable, be removed within 24 hours, preferably through an abdominal incision.

Vaginal ovariectomy may be performed in non-adherent cases; but, though simpler in technique, avoiding an abdominal scar and requiring fewer instruments, it is inferior to the abdominal operation in that there is greater danger from hæmorrhage, difficulty in safely tying the pedicle, the necessity of cutting up the tumour, the impossibility of examining the other ovary, and from the presence of the vaginal wound.

Induction of premature labour, forceps, version, and simple tapping of a cyst as means of overcoming the dystocia produced by ovarian tumour are absolutely contraindicated.

#### D. IN THE PUERPERIUM.

Ovarian tumours should be removed as soon as practicable, when possible within 24 hours of delivery. If there is doubt as to the aseptic condition of the uterus, a delay of a week or two may be advisable, unless indications of strangulation or infection of the tumour arise, when the tumour should be immediately removed.



## LECTURE III.

*Cancer of the Uterus Complicating Pregnancy, Labour and the Puerperium.*

(With Tables E and F.)

IN the Tables are given brief particulars of the 10 cases of cancer of the cervix complicating pregnancy, labour and the puerperium, which I have had under my care at University College Hospital. They comprise all the cases I have seen; I have not met with a case in private practice.

CASE 1 (see Table E, No. 1).—M. A. W., aged 36, married (children 9, abortions 2), came to the out-patients' department of U.C.H. on September 8th, 1891, at 1 p.m., aborting at the fifth month of pregnancy and complaining of pain in the back. She had a rigor soon after admission. The abdomen was very tender below the umbilicus and over the lumbar region of the spine. The pain appeared to start from the fifth lumbar vertebra behind, and radiated to the front under the ilium, and was very marked in the hypogastrium.

The pregnant uterus reached up to the umbilicus.

*Per vaginam* a hard nodular and rough growth was felt on the cervix, which did not bleed readily on examination. The os admitted the finger, and the membranes could be felt. Through the speculum, the cervix was seen to be covered with a pale, yellowish-pink granular and nodular growth, measuring 2 inches across. No ulceration was seen. The patient was at once admitted to the ward. At 8 p.m. the os was as big as a florin, the membranes bulging. The cervix rapidly dilated, and at 9 p.m. the membranes broke. A foot presented, and the cervix was felt to be lacerated. The foetus was born naturally at 10.15 p.m.

It was impossible to express the placenta; it was therefore extracted entire by hand at 11.5 p.m. The cervix was torn posteriorly, and the posterior wall of the lower segment of the uterus was found to be much thickened by growth.

An intra-uterine douche was given, and ergotin was injected hypodermically. There was very little bleeding afterwards. The temperature, which had been 103° during the abortion, dropped to 102°·4, but at 3 a.m. next day was 104°·2, and later 105°·4, and every day rose to 104° or 105°, with rigors almost daily. On September 12th the patient complained of pain in the legs and calves and popliteal spaces; the legs were swollen. She had evidently septic thrombosis of the iliac veins.

The patient died from the sepsis on September 26th, 1891.

CASE 2 (see Table E, No. 2).—E. J., aged 40 (children 9, the last three years ago, abortion 1), was admitted December 23rd, 1895, when six months pregnant. She had flooded every month during the pregnancy; the bleeding came on at the periods and lasted a week. She had not wasted.

Menstruation began at 16, recurred every two or three weeks, for six or seven days, six diapers being used.

The patient took a good deal of alcohol.

TABLE E.—*Author's Cases of Early\* Pregnancy complicated by Cancer of the Cervix at University College Hospital, from July, 1887, to October, 1919.*

No.	Age.	Children.	Abortion.	Month of pregnancy.	Result to mother. L = lived. D = died.		Result to child. L = lived. D = died.		Mode of delivery.	Operation performed.
					Immediate.	Remote.	Immediate.	Remote.		
1	36	9	2	5th	D (sepsis, Sept. 26, 1891)	—	D	—	Natural *	No; too far advanced for curative operation; natural abortion, Sept. 8, 1891. Admitted with fever, 103°; septic; rigor.
2	40	9	1	6th	D (sepsis, Feb. 1, 1895)	—	L	D (in two days)	Natural	No; too far advanced for curative operation; natural abortion, Jan. 23, 1895. Admitted febrile, 100°, P. 116.
3	29	1	0	6th	D (Nov. 25, 1906, undelivered)	—	D	—	Undelivered	No; too far advanced for curative operation.
4	26	2	0	4th	L (of recurrence, Sept. 24, 1907)	D	D	—	Pregnant uterus removed	Vaginal hysterectomy with the galvano-cautery, March 15, 1906.

\* Before the 8th calendar month.



There was copious bleeding from the vagina, which necessitated plugging. A very extensive growth,  $2\frac{1}{2}$  inches across, mainly on the right side of the cervix, extended on to the vaginal wall. *Per rectum* there was thickening of the left broad ligament. The patient refused to remain in the hospital, but returned on November 4th. She was then very ill, bleeding, febrile, temperature  $100^{\circ}$ , pulse 116. On January 23rd, at 6 p.m., labour began; the pains were feeble and infrequent. At 8 p.m. the os admitted two fingers. The breech presented.

Chloral hydr. gr. xxx was given, and repeated in three hours.

At 11.30 p.m. the os was  $2\frac{1}{2}$  inches in diameter; pains were strong and frequent. Douches of iodine solution were given. At 2.30 a.m. on January 24th, temperature  $101^{\circ}$ , pulse 128, the growth appeared to be yielding. The general condition was fairly good. At 4.30 a.m. the pains were very strong, and the os was nearly dilated. At 5 a.m. the membranes were ruptured. The child was delivered naturally. It weighed 3 lb.  $4\frac{1}{2}$  oz., was premature, of about 6 months' development, and only survived two days. The placenta weighed  $9\frac{1}{2}$  oz.

On the 31st the patient complained of pains in left thigh, which measured  $3\frac{1}{2}$  inches more in circumference than the right; the left femoral vein was thrombosed.

The patient gradually sank, and died of septic phlebitis and pyæmia on February 1st, 1896. At the *post-mortem* examination the heart was fatty ( $14\frac{1}{2}$  oz.), with a small abscess in its wall. The right lung was œdematous; spleen  $10\frac{1}{2}$  oz., pulpy; kidneys pale; no fluid in peritoneum, no peritonitis. The uterus reached 4 inches above the pubes; two-thirds of it lay to the right of the middle line. An extensive sloughing growth was found all over the top of the vagina. The left femoral vein was blocked by a brownish-red clot, breaking down into strawberry coloured pus, which extended into the saphena and profunda veins. The growth was a squamous-cell carcinoma; it extended into the vagina as a lobulated fold on the posterior wall for 2.5 cm. and as a ragged ulcerated growth on the anterior wall for 3 cm. (see Fig. 18).

CASE 3 (see Table E, No. 3).—L. F. C., aged 29, single, had had one child (December 20th, 1905), which was syphilitic. Her grandfather died of cancer.

Menstruation had been regular (five days, eight or nine diapers) before her pregnancy. On October 3rd, 1906, she complained of a brownish-black foul-smelling discharge and pain on the right side of the pelvis, which had been present for seven weeks.

The patient had a flooding in the first week of June; she had noticed nothing wrong till then. In July she had three floodings. Seven weeks ago she had her last hæmorrhage, followed by discharge, which had been continuous since. On September 10th she passed a few clots. She had not wasted.

The uterus was felt rising up to 1 inch above the umbilicus; ballottement could be obtained and the uterine souffle, but no heart sounds could be heard. There was tenderness in the left iliac region.

The vulva was sore and a foul-smelling discharge was present.

The cervix was replaced by a crateriform ulcer, which had eroded most of the posterior lip, and involved the vaginal vault.

The cellular tissue in the left uterosacral ligament and behind the bladder was indurated. No definite thickening could be felt in the broad ligaments, but the uterus was fixed. On October 11th there was



a considerable loss of blood, for which iodoform gauze packing was employed. The patient complained continually of much pain, for which bromide of potassium, veronal, and morphia were given.

She rapidly lost flesh, and was very ill and drowsy. On November 25th incontinence of urine occurred, and the patient was very weak. On November 27th the temperature rose to  $106^{\circ}$ . The patient had for some days been in a typhoid state, and did not require opium for the pain.

Uterine contractions set in at 10.45 p.m., at intervals of five minutes, lasting 15–20 seconds. At 11.45 p.m. the patient died.

There had been little rise of temperature during her stay in hospital, except on November 24th ( $101.4^{\circ}$ ) and November 27th ( $106^{\circ}$ ), otherwise it had only on three occasions risen over  $100^{\circ}$ . The pulse was usually over 100.

A mesial section of the body was made by Mr. T. W. P. Lawrence, the Curator of the Museum, after the body had been injected with formalin through the femoral artery, and had lain for five months in formalin solution.

A drawing by Mr. Shiells, made from a tracing of the section on glass, is exhibited. It shows the upper border of the uterus on a level with the disc between the second and third lumbar vertebræ, the placenta on the anterior wall, the upper part of the cervical canal dilated (by the labour pains) in a conical form, the lower part prevented from dilating by the cancer, which extensively involves the fornices and wall of the vagina.

The growth was a squamous-cell carcinoma.

CASE 4 (see Table E, No. 4).—F. A. W., aged 26 (born February 19th, 1880, as shown by her birth certificate) (children 2—1 stillborn, 1 died 6 days after birth—abortion 0), was admitted on March 10th, 1906.

There was no family history of malignant disease.

Menstruation ceased in November.

On admission the patient was flushed, the radial pulse very feeble. The uterus rose to a height of 5 inches above the pubes. The cervix was long, the orifice enlarged, and surrounded by a large growth, evidently carcinoma, rough and shaggy on the surface, and breaking down on examination. The cervix measured  $2\frac{1}{2}$  inches across, and was covered by a pink growth, bleeding slightly on pressure. It formed a mushroom-shaped growth about as big as a Tangerine orange. The uterus appeared to be movable, and the ligaments not to be infiltrated. The uterus was evidently pregnant about  $3\frac{1}{2}$  months, although the patient thought that she had miscarried six weeks ago.

On March 15th, after a douche of formalin solution had been given, vaginal hysterectomy was performed with the galvano-cautery, the broad ligaments and the uterine arteries being tied with silk ligatures left long.

The cautery incision went beyond the growth, but the utero-sacral ligaments appeared to be thickened, and further pieces were removed from them by the galvano-cautery.

The body of the uterus, when pulled down, with the volsella, tore, and the foetus and part of the placenta escaped (see fig. 19). The patient was shocked by the operation, but had no pain at all afterwards. The temperature only once rose over  $100^{\circ}$  ( $100.4$  on the 18th day). On April 20th the ligatures were removed.

The patient left the hospital on April 23rd. Thirteen months later, on May 7th, 1907, there was a recurrent mass in the pelvis as large as



an apple. The patient died on September 24th, 1907, just over 18 months after the operation.

The growth was a squamous-cell carcinoma.

Cases 5, 6 and 7 have been published with full details in the 'Obstet. Soc. Trans.,' vol. 46, for 1904. I shall therefore only give an abstract of them here and bring the after-histories up to a later date. In all these cases the growth was a squamous-cell carcinoma (specimens and microscopic sections exhibited).

CASE 5 (see Table F, No. 1).—E. W., aged 33 (children 4, abortion 1), was delivered on March 25th, 1893, by forceps through a cancerous cervix, of a full-term living child, which died of whooping cough when 11 months old. The labour was slow. The patient had had a discharge of blood for eight months. There was no *post-partum* hæmorrhage.

On April 8th, 1893, high amputation was performed with the Pacquelin cautery. On June 6th, 1894, she became pregnant in the body, which had been left behind. On March 6th, 1895, I delivered her by Cæsarean section, terminated as a Porro's operation, with extra-peritoneal treatment of the stump. This child grew up and served as a soldier in the Great War, 1914–1918. In 1918, 25 years after the high amputation, the mother was examined by me and found to be in excellent health (see Figs. 20, 21).

CASE 6 (see Table F, No. 2).—A. C., aged 35 (children 8, abortion 0), was admitted to U.C.H. on January 3rd, 1896, when seven months pregnant. She had had hæmorrhage on coitus for seven months, and a thin, watery offensive blood-stained discharge for six months. There was a large cancerous growth on the posterior lip and left side of the cervix. Labour was induced by de Ribes's bag: the child (3 lb. 7 oz.) lived only 38 minutes.

On January 28th, 1896, I removed the cervix by the high amputation with the Pacquelin cautery.

I have seen this patient many times since the operation. I examined her in 1918, 22 years after the operation, and found her free from recurrence and in excellent health (see Figs. 22, 23, 24).

CASE 7 (see Table F, No. 3).—M. S., aged 38 (children 9, abortion 0), was delivered in the maternity of U.C.H. on January 25th, 1896, naturally of a living child. She had had no bleeding during the pregnancy, but blood and shreds were passed every day afterwards. On June 5th, four months and 11 days after delivery, she was examined and found to have cancer of the cervix. High amputation was performed on June 30th, 1896. In 1915, 19 years after the operation, I examined the patient and found her free from recurrence and in excellent health. The child lived at least to the age of eight years. I have no further note about her, and the mother's present address is unknown (see Figs. 25, 26).

CASE 8 (see Table F, No. 4).—M. A. C., aged 30 (children 6, abortion 3), married at 18, was admitted to U.C.H. on January 10th, 1888, near term, having last menstruated on April 6th, 1887. In October and November, 1887, she bled a little every day for six weeks; but although she afterwards occasionally lost a little blood, she did not lose much till four days before admission, when she flooded to the extent of about half a pint. She had no pain except at the bottom of the back; this she had

TABLE F.—*Author's Cases of Advanced\* Pregnancy complicated by Cancer of the Cervix at University College Hospital, from July, 1887, to October, 1919.*

No.	Age.	Children.	Abortion.	Month of pregnancy.	Result to mother. L = lived. D = died.		Result to child. L = lived. D = died.		Mode of delivery.	Operation performed.
					Immediate.	Remote.	Immediate.	Remote.		
1	33	4	1	Term	L	Well 25 years after high amputation of cervix.	L	Died 11 months later of whooping cough	<i>Per vaginam</i> , forceps	High amputation of cervix (April 8, 1883), a fortnight after delivery. Two years later, Porro-Cæsarean section with living child, who served as a soldier in the war 1914-1918.
2	35	8	0	8th	L	Well 22 years after high amputation of cervix	L	Died in 38 minutes	<i>Per vaginam</i> , induction of labour by de Ribes bag	High amputation of cervix (Jan. 28, 1896), 18 days after delivery.
3	38	9	0	Term	L	Well 19 years after high amputation of cervix	L	Well 8 years later	<i>Per vaginam</i> , unassisted, easy	High amputation of cervix (June 30, 1896), 5 months after delivery.
4	30	6	3	8th	L	Died 7 months later	L	Living 6 months later	<i>Per vaginam</i> , forceps	No; too far advanced for curative operation.
5	39	12	3	8th	L	Died 12 months later	L	Living 6 months later	<i>Per vaginam</i> , forceps; rupture of uterus	No; too far advanced for curative operation. Rupture packed with iodoform gauze.
6	34	10	1	8th	L	Died 7 months later	L	Died 15 days later	<i>Per abdomen</i> , by Porro-Cæsarean section, with use of serre-nœud	No; too far advanced for curative operation.

\* In the 8th or 9th calendar month.



always had when pregnant. For two months, however, she had noticed a forcing pain in the womb in the evening after much exertion; it was diminished by rest.

There was no family history of tumours.

Labour began on January 8th at 12.20 A.M., by the breaking of the waters, of which about 3 pints escaped. The pains were feeble at first, but at 3 A.M. the pains became stronger, and at 11.30 A.M. she sent to the hospital for assistance, as the pains were occurring every 5 minutes. The os was as big as a florin; on the anterior lip of the cervix was a carcinomatous growth extending round the os on each side in a horse-shoe shape leaving about three-quarters of an inch of the posterior lip unaffected. The growth was thick, nodular, and hard, and it appeared to be necessary to perform Cæsarean section to deliver her. She was brought to the hospital for that purpose at 4.30 P.M. The os had now dilated considerably, and, in consultation with Sir John Williams, it was decided to attempt delivery with forceps. This was done without difficulty. The placenta came away without much loss of blood. The child was resuscitated in about 10 minutes.

Sir John Williams suggested that the cancerous cervix might be removed with the cautery, and in view of my results in other cases I have always regretted that I did not carry out the suggestion. Although there was a slight laceration of the cervix on each side and a little thickening of the broad ligament on the left side, I think it would have been quite possible to remove the cervix beyond the growth.

The patient made a good recovery, and was discharged on January 29th.

On March 5th she was admitted again for bleeding and discharge. She had some discharge when she left the hospital, and after a fortnight she began to bleed slightly. Two days before her re-admission she lost a good deal of blood and watery inoffensive discharge. The whole of the vagina was found filled with a mass of new growth. The temperature was 105°. On March 19th these growths had extended down to within 1½ inch of the vulva. The broad ligaments were thickened. The patient gradually wasted, and died on August 3rd, 1888, seven months after delivery. The child died on September 28th, 1888, when eight months old.

CASE 9 (see Table F, No. 5).—J. H., aged 39, married 23 years (children 12, abortion 3), was admitted on November 12th, 1896, pregnant 7½ months. Her last child had been born three years ago. She had been told at a hospital 12 weeks before her admission that she was not pregnant, and had an incurable tumour; soon afterwards the patient felt movements of the child. She had had a miscarriage in December, 1895, followed by frequent hæmorrhages.

The patient had had no bleedings at all for the last three months, but a good deal of pain and yellow discharge; for the eight months preceding she had bled profusely every two or three weeks, and had had acute pain in the lower part of the abdomen and in the womb.

Menstruation began at 11, and was always regular till the last miscarriage. All the children had been born naturally head first. She had lost a good deal of flesh during the last eight months. The uterus was of the size of the organ at 7½ months, the child alive, presenting in the first vertex position. A loud souffle could be heard on the left side of the lower segment, none on the right. The vagina was dusky purplish red. The cervix was greatly enlarged; the anterior lip contained a



growth which did not bleed readily on examination. It appeared to extend to the vaginal wall. The growth was smooth, of a dusky salmon colour, and when wiped was seen to be pitted with several holes from which bright yellow "pus" exuded in quantity (see Fig. 26). The edge of the growth was raised above the surface of the vaginal cervix, but it neither bled nor broke down when pressed upon. On the posterior lip or in its situation—for it had been torn—there was a small papillary surface. The diagnosis was that the growth was an "adenoma," or an inflamed and hypertrophied ectropion of the cervical mucosa. The "pus" was sterile bacteriologically. Nearly every day for a month the cervix was swabbed with 1 in 3,000 perchloride of mercury solution: this never caused the slightest bleeding.

On January 4th labour set in; at 11 p.m. the pains became strong. At 5 a.m. on January 5th the pains, which had been lulled with chloral hydrate (30 grains), became stronger; the cervix remained rigid. At 4 p.m. the os was  $2\frac{1}{2}$  inches in diameter; at 8 p.m. no bigger; at 7 a.m. slightly larger. At 8 p.m. there was a large "caput," the patient became livid, and at 8.30 p.m. she collapsed, and blood escaped from the vagina (rupture of the cervix). The forceps was applied and the child easily delivered. There was a considerable loss of blood afterwards, and the hand introduced found an extensive rupture of the cervix on the right side, admitting two fingers into the broad ligament, but not opening the peritoneum. The tear was packed with iodoform gauze, which was removed on January 7th, and douches given. The patient made a good recovery and left the hospital on January 29th with her baby.

On February 20th the growth was as big in area as a walnut; it was not thought to be malignant.

On May 7th the growth was as big as a Tangerine orange, was evidently malignant, and had extended into the tissues around.

On June 30th, 1896, the child weighed 1 st. 4 lb.

The patient died of the cancer on January 11th, 1897, 12 months after delivery.

The growth was a columnar-cell carcinoma, the cells being arranged in masses.

CASE 10 (see Table F, No. 6).—C. C., aged 34 (children 10, abortion 1), was admitted to U.C.H. on March 20th, 1903. In July, 1902, she had been in the hospital for "endometritis" and lacerated cervix, which had resulted from a difficult labour two months before (breech presentation: the child died). A month after leaving the hospital she became pregnant, and had since bled slightly, for a day only, every fortnight, and had a yellow discharge, which became offensive in February, 1903. Since that date she had had severe pain in the abdomen, sometimes of a twisting character. Menstruation began at the age of 11, had been regular every three weeks, lasting a week and always profuse. There was no history of cancer or tumour in the family.

The patient had been married at 17, and had had 10 children and a miscarriage. On admission she was eight months pregnant, and had been in labour for 48 hours. She was having severe labour pains: the pulse was feeble (116). The labour had started with rupture of the membranes, and the uterus was found to be firmly retracted around the child. There was an extensive growth as big as a hen's egg on the anterior lip, affecting also the posterior lip. It extended under the vaginal mucous membrane to the right side and in front of the cervix,



so that it probably encroached upon the bladder and right ureter. It also extended up the cervical canal on the right side, the os being open to admit the finger easily.

Cæsarean section was performed and was terminated by Porro's amputation with the Kœberlé *serre-nœud*. The operation (which revealed a malignant iliac gland and invasion of the cellular tissue on the right side) lasted 30 minutes. The child was alive; but died on the 15th day. The mother recovered; but died of the cancer seven months later. At the time of the operation the temperature was  $100.2^{\circ}$ ; after the operation it rose to  $100.6^{\circ}$ ; then did not rise above  $100^{\circ}$  for 14 days. On the 15th day it reached  $101.2^{\circ}$ , and for the next week was slightly over  $100^{\circ}$ , then gradually fell to normal. She left the hospital on April 21st. At home she gradually wasted, had a good deal of pain, and died seven months after the operation.

The rarity of the combination of cancer of the uterus with pregnancy is shown by the fact that few gynecologists have published even such a small list as 10 cases. And their cases have not been all personally treated by the authors, but are often the collected cases of clinics published in inaugural dissertations and theses, the writers of which are inexperienced and are wanting in the intimate knowledge which only personal attendance can give. In the clinic of Professor Wertheim, who has had such an extensive experience of this disease, amongst 250 cases of cancer of the cervix only six were complicated with pregnancy and some of these were not treated by the Professor. The largest series attended at one clinic I have been able to find is that published by Glockner,\* consisting of 17 cases from the Gynecological Clinic of Zweifel at Leipzig followed by a series of 10 cases from the same clinic by Aulhorn.† In 1904 Sarwey‡ had been able to collect from the literature only 240 cases of this complication which had been subjected to operation and he states that v. Winckel had met with 10 cases in 20,000, Stratz 7 in 17,832, Sutugin 2 in 9,000, Glockner 17 in 26,000, Orthmann 6 in 4,028, Doderlein 7 in 5,001, the Rostock clinic 4 in 2,287 labours and gives the frequency as 1 in 1,600 labours.

#### *Age of the Patients.*

Of the 10 patients 2 were between the ages of 20 and 30 = 20 per cent.; 7 were between the ages of 30 and 40 = 70 per cent.; and 1 was between the ages of 40 and 50 = 10 per cent.

The youngest patient was 26, the oldest 40.

\* 'Beiträge für Geb. und Gyn.,' Leipzig, 1902.

† 'Archiv für Gyn.,' vol. 92, p. 242.

‡ 'Veit's Handbuch der Gyn.,' vol. II, p. 850 (1908).



In dividing patients according to decennia "20-30," etc., a patient aged 30, should appear in the 30-40 list; some writers erroneously put the patient in the 20-30 list and thus the statistics may be misleading. Sarwey's patients were divided into 20-30, 31-40, 41-50, which is not a decennial division at all.

Of his collected series of patients 17·8 per cent. were between 20 and 30; 64·4 per cent. were between 31 and 40; and 17·8 per cent. were between 41 and 50.

Sarwey shows from the ages of 3,442 cases not complicated with pregnancy that only 3 per cent. were between 20 and 30; 22·4 per cent. were between 31 and 40; 34 per cent. were between 41 and 50.

The figures show that in the child-bearing period of life, cancer uncomplicated with pregnancy is at its maximum in patients over 40, but when complicated with pregnancy under 40; and that below 30 the frequency of cancer is six times as great in the pregnant as in the non-pregnant.

The youngest of my patients was 26 years of age. I have never met with cancer of the cervix at an earlier age than this. Of Sarwey's collected cases the youngest (Schwarzwallers) was only 22, the oldest was 47.

#### *Number of Children and Abortions.*

Cancer of the cervix is very rare in women who have not been impregnated. Olshausen and Döderlein have published cases of cancer complicating the first pregnancy. Cancer even in the second pregnancy is rare, having been found only six times in Sarwey's 180 cases. To these may be added my Case 3.

My 10 cases had had in all 70 children and 11 miscarriages, that is an average of 7 children and over 8 pregnancies. Six out of the 10 patients had had 8 children, and half of them had had 9 or more children, the greatest number of pregnancies being 15 (Case 9). The influence of multiparity is thus shown, as in all the statistics dealing with this combination.

Why cancer of the cervix should be almost confined to parous women and so extremely rare in virgins is a question which has been much discussed. Lacerations during labour and abortion have been supposed by many to be the causes of the development of cancer in this situation. Observations on this point are few in number; but Sir John Williams has published a striking case where the laceration was the only part of the os not affected. It seems



probable that lacerations, by exposing the cervical mucous membrane to external irritation, may tend to favour the development of cancer, but its influence is probably small; for cancer often develops in cases in which there is no sign of previous laceration, and in situations where lacerations do not occur; and moreover cancer of similar structure occurs in the body of the uterus in which the question of laceration does not arise.

Dr. King, of Washington, propounded a theory that the development of cancer was set up by the influence of spermatozoa in giving rise to multiplication of the epithelial cells, under certain conditions, in the same way as they cause development of the cells of the ovum.

Erosions have been thought by some to be a pre-cancerous condition, and very radical methods of treatment have been suggested in consequence. As erosions are very common in virgins, in whom cancer of the cervix is met with with extreme rarity, it is quite certain that erosions rarely develop into cancer. Nevertheless, in erosions are sometimes found both metaplasia and hyperplasia and even slight downgrowth of the epithelium, which renders the differential diagnosis from early carcinoma occasionally difficult. And to the naked eye a case of this kind sometimes shows papillary, club-like, or finger-like processes, or even extensive papillomatous growths which may closely resemble cancer. These growths are, I think, sometimes the result of excessive sexual irritation and of venereal infection. And I am inclined to think that when the question of the causation of cancer of the cervix is solved it will be found that the reason why this disease is almost limited to women who have had coitus is that local venereal infection is almost limited to them. I do not know of a series of scientific investigations into the relations of syphilis, soft sores and gonorrhœa to cancer of the cervix, but I believe it will be found to be a close one. I have twice seen cancer of the cervix develop in patients who had previously had a chancre of the cervix.

#### *Influence of the Cancer on the Pregnancy.*

Cancer of the cervix by obstructing the canal, by the hæmorrhages and discharges to which it gives rise and the infection and inflammation which often accompany it, tends to prevent the occurrence of pregnancy, and when it occurs to produce abortion or premature labour.



Of my ten cases two aborted spontaneously at the fifth and sixth month. Case 3 died undelivered from coma, probably due to syphilitic brain disease, possibly to renal disease from pressure on the ureters. Case 4 was operated on at the fourth month. Of the remaining six cases four were delivered prematurely at the eighth calendar month; one of these was induced; the other two were at term.

Both the cases which aborted were septic on admission to the hospital, and it is probable that the infection brought on the abortion. Apart from this there does not appear to be a great tendency for abortion to occur in the early months. Of the six cases of pregnancy in the eighth and ninth calendar months in no less than three labour came on prematurely, which seems to show a great tendency to premature delivery. The growth may in some cases be so extensive as to prevent the delivery of the child, and "missed labour" may occur. In Case 9 the uterus ruptured during labour.

It is to hæmorrhage, sepsis, and rupture of the uterus that the high mortality of this complication is due.

#### *Influence of the Pregnancy on the Cancer.*

The influence of the pregnancy on the cancer has been varied in different cases. Zweifel's case in which the growth extended by two fingers' breadth in the course of a fortnight has probably attracted unusual attention from the method employed to estimate the rate of growth, viz., passing a thread through the edge of the growth—a procedure not altogether free from risk!

In Case 9 the growth apparently did not alter in size at all during nearly two months' daily observation. After the labour it at first diminished, but began to increase about two months later.

The three cases (8, 9, 10) which were inoperable survived from seven to twelve months, which does not show any marked rapidity of growth after delivery, seeing that in all the cases the growth had reached an advanced stage at the time of delivery, which was difficult (forceps, Cæsarean Section, forceps for rupture of uterus).

#### *Symptoms.*

Of the three chief symptoms of cancer of the cervix, hæmorrhage, discharge, and pain, the most important is the hæmorrhage. When



the cancer complicates pregnancy the hæmorrhage may lead the patient to think she is not pregnant or has miscarried.

*Hæmorrhage* as a result of coitus is a symptom of the greatest importance. It occurred as the first symptom in Case 6, and was followed by a characteristic thin, watery, offensive, bloodstained discharge, which, after it had existed for six months, led the patient to seek advice. In some cases, however, the growth does not bleed as a result of pressure upon it. An instance of this was Case 9, and Kreps\* has published a similar one.

In some cases the hæmorrhage occurs at approximately monthly periods, and thus leads the patient into error with regard to the presence or duration of pregnancy.

The second cardinal symptom, *discharge*, is often the first in point of time, but is unnoticed by the patient, owing to the frequency with which it occurs from other causes. When, however, it is watery and discoloured, or bloodstained, it should at once arouse suspicion; an offensive discharge is due to necrosis, and often occurs only in the later stages of the growth.

The third cardinal symptom, *pain*, ordinarily does not occur in cancer of the unimpregnated uterus until the growth has extended beyond the organ; occasionally inflammation resulting from bacterial infection will cause it to appear while the growth is limited to the cervix. In cases complicated by pregnancy, pain may occur at an earlier date, being due to contractions of the uterus or to a threatened or actual abortion, as well as to septicæmic infection, which is very prone to occur in these cases (1 and 2). The secondary symptoms—wasting, malaise, cachexia, pressure symptoms—do not differ from those met with apart from pregnancy.

### *Diagnosis.*

Cancer of the uterus complicating pregnancy always affects the cervix: there is, so far as I know, no case recorded of cancer of the body complicating pregnancy which will stand investigation. The cases formerly published were either cases of chorionepithelioma or sarcoma.

In making the diagnosis, three methods are employed (*a*) digital pelvic examination, (*b*) inspection, and (*c*) microscopical examination.

\* "Ueber Komplikation der Gravidität mit Uteruscarcinom," 'Inaug. Dis.,' Berlin, 1905, p. 35.



In the early months it may be difficult to make out the condition of the pregnant uterus on account of the presence of the growth and the bleeding to which bimanual examination may give rise. On the other hand, the uterus is not rarely distended by pus (pyometra) in cases of cancer of the cervix, and it may then closely simulate a pregnant uterus, especially if menstruation has stopped. This will rarely occur apart from pregnancy until the age of the menopause (47), and pregnancy at this age is so exceedingly rare that only one case was recorded in Sarwey's collection.

On vaginal examination, either a growth or an ulcer will be felt, both differing markedly from the normal cervix by being comparatively hard and brittle, breaking down under the finger, and bleeding on pressure with the finger or the point of a sound. In later stages the uterus may be fixed by inflammation or growth in the cellular tissue; this is most easily made out by rectal examination.

On inspection through a speculum—a large Fergusson speculum, with the patient in the lithotomy position, is best for this purpose—an irregular growth with nodular or club-like processes, with or without ulceration, may be found. The colour of the growth is livid red, often sloughy on the surface, and may contrast with the purple colour of the vaginal cervix. The surface of the growth should be dried with absorbent cotton-wool, the overhanging edge noted, and the bleeding and breaking down on pressure. If ulceration be present, the only conditions likely to be mistaken for it, viz., tubercle and syphilis, are rare.

In some cases only a hard, smooth enlargement of the cervix is met with; there is neither a projecting irregular breaking-down growth nor ulceration, the growth being in the wall of the uterus. In these cases the finger is easily passed into the cervical canal and recognises the bleeding growth. A piece of this should be removed for microscopical examination in all cases. This is rendered especially necessary as the syphilitic and tubercular affections cannot be distinguished by clinical methods, but are easily recognised under the microscope.

In ordinary cases the diagnosis of the growth is quite easy; the marked contrast of the brittle, bleeding growth with the soft tissues of the cervix of pregnancy leaves no doubt. There are, however, certain diseases of the cervix which closely resemble cancer and certain cases of cancer which lack the usual signs.



*Conditions resembling early Cancer of the Cervix.*

Hypertrophied papillary or nodular erosions, hypertrophied and inflamed glandular erosions, and papillomata (simple and diffuse) may closely simulate cancer.

By *hypertrophied papillary or nodular erosion* I mean a growth with club-like processes or lobules made up of thick connective tissue centres, often containing dilated glands, covered with a single layer of columnar or cubical epithelium. I have not met with this form during pregnancy, but the diagnosis would be difficult without microscopical examination. This form, however, is not friable.

I exhibit a well-marked example of it (see fig. 28). Hofmeier\* has recently called attention to a similar condition which he mistook for cancer.

By *hypertrophied and inflamed glandular erosion*, I mean a granular condition similar to the ordinary glandular erosion but much larger and more vascular; it sometimes measures as much as  $1\frac{1}{2}$  inches across and can be broken into with the point of a sound and bleeds readily on examination. It does not break down to the extent that cancer does, and the growth does not project from the surface, but in some cases it is necessary to excise a piece in order to exclude cancer. I have not met with this condition in pregnancy, but in the unimpregnated uterus have several times mistaken it for cancer until the microscope showed its nature.

*Papillary growths* are met with in several forms. The pedunculated papillomata of gonorrhœa are occasionally found on the cervix, but rarely I think without being present on the vulva or vagina. This scattered distribution is an aid in diagnosis.

Broad flat papillomata with a finely granular surface may be met with both in gonorrhœa and soft sores and I believe as a result of masturbation. They bleed and break down under the finger, are generally softer and more friable than cancerous growths and can be often pinched off the surface of the cervix with a forceps leaving a raw red surface fairly smooth and bleeding freely. Under the microscope a central vascular stem supported by connective tissue is seen surrounded by a mass of large epithelial cells, often cedematous or vacuolated.

Also there occur occasionally more solid isolated polypoid or

\* 'Monatsschr. für Geb. und Gyn.,' Bd. 50, p. 30 (1919).



sessile nodules in the cervical canal and at the external os which consist of stroma of the cervix covered by many layers of squamous epithelial cells (metaplasia of cervical columnar epithelium). In the substance of these growths gland spaces may be cut across of which the epithelium has also undergone metaplasia, so that the spaces are filled with squamous epithelium. If these growths be cut without the subjacent and adjacent tissue the appearance is not distinguishable from squamous-cell carcinoma, although a deeper section shows no such invasion of the deeper tissue of the organ as occurs in true carcinoma. In excising a portion of the cervix for microscopical examination a wedge-shaped piece should be removed including the edge of the suspected growth, and after the wedge has been excised care should be taken that the microscopic sections are cut vertically to the free surface and not parallel to one side of the wedge.

Lastly, I would like to direct attention to the unusual features of Case 9 which led to an erroneous diagnosis (Fig. 27). The peculiar features were (1) the smooth surface of the growth pitted by several holes from which a pus-like fluid escaped in considerable quantity; (2) The fact that the growth did not bleed at all although it was dressed almost daily for nearly two months; (3) that the growth did not break down under moderate pressure; (4) that it did not apparently increase at all during two months' observation, and in the puerperium at first diminished in size.

I do not remember to have seen another case of cancer of the cervix in which these "pus" holes were present, although I have seen several in cancer of the vulva. In this case it is to be regretted that a piece was not excised; this would at once have shown that the growth was a columnar-cell carcinoma, and that the "pus" was the liquefied central epithelial cores.

Although the microscope is of the highest value and is indispensable for the diagnosis of certain cases, clinical examination is also of great importance. For want of this I have known a distinguished pathologist decide as the result of the examination of a microscopical section that only normal cervical glands were present when clinical examination showed a deeply invading cancer. In this case the rare form of the cancer—"carcinoma adenomatodes"—in which the glands are lined with a single layer of columnar epithelium would have led to a serious error if reliance had been placed on the microscopic examination alone and the clinical signs had been neglected.



Tables of cases of cancer of the cervix in "Advanced Pregnancy"\* treated by vaginal or combined abdominal and vaginal operation from the papers of Glockner (10 cases), and Olshausen and Kaussmann (8 cases) have been published by the lecturer in the 'Obstet. Soc. Trans.,' Vol. XLVI, pp. 369, 371. Of these 18 cases 12 were operable and gave immediately two maternal and four foetal deaths. One mother treated by vaginal hysterectomy 17 days after labour survived for five years—Olshausen's case ( $5\frac{3}{4}$  years)—the percentage of cures was therefore 8·3 per cent. The immediate mortality was 16·6 per cent. The final result to the children was not given, but the immediate mortality was five or 41·6 per cent.

Five cases were "inoperable" and were treated by Cæsarean section or Cæsarean hysterectomy with intraperitoneal or (in one case) extraperitoneal stump. Of the five mothers four died and the fifth survived only 5 months, showing an immediate mortality of 80 per cent.

The percentage of cures of the 18 cases, operable and inoperable, was 5·5 per cent.; the total immediate mortality (in all cases operable and inoperable) was  $6 = 33\cdot3$  per cent., the operation mortality was 16·6 per cent.

E. Aulhorn† has published a series of 10 cases from Zweifel's clinic showing the results of abdominal hysterectomy for cancer complicating pregnancy.

Three of the patients were in the last month of pregnancy. One died of pulmonary embolism on the ninth day after the operation; the second recurred within 6 months; the third was free from recurrence after "a good 5 years" (no dates or details of the cases are given); *i.e.*, of the cases in advanced pregnancy 33·8 per cent. were "cured."

Seven of the patients were in the early stages of pregnancy (up to the eighth lunar month); of these two recurred (after 6 months and 2 years) and five remained free from recurrence for from 2 to  $3\frac{1}{4}$  years.

E. Wertheim‡ gives a list of six cases from his clinic:—

One of these was advanced in pregnancy but was not in labour. The patient remained free from recurrence 5 years after the

\* In the 8th, 9th, or 10th lunar month.

† 'Archiv für Gyn.,' vol. 92, p. 242.

‡ "Die erweiterte abdominelle Operation bei Carcinoma Colli Uteri," 1911, p. 196.



operation of extended abdominal hysterectomy (Wertheim). The case was operated on by Micholitsch.

Five of the cases were in the early stage of pregnancy (one at the sixth lunar month, one at the fifth month, and in three the embryo only measured 1 to 3 cm.). One of the patients died of embolism on the 14th day after operation; in one recurrence took place; the other three patients remained free from recurrence after 5 years.

Thus, four out of six (or 66·6 per cent.) of the cases from Wertheim's clinic remained well after five years. This is, so far as I know, the best result which has ever been obtained in cases of cancer complicating pregnancy.

P. Glarner\* has published the cases occurring in the clinic of Professor Wyder at Zürich from 1888–1897.

There were eight cases of cancer of the cervix, besides one of cancer of the vagina; all the mothers recovered and two children survived.

Three of the cases were in advanced pregnancy.

All were treated by Cæsarean Section, followed by total abdominal hysterectomy, two children surviving. All the cases recurred and died within a few months.

Five of the cases were in early pregnancy.

Abortion was induced in two; vaginal hysterectomy was performed in one case; abdominal total hysterectomy was begun (apparently not completed) in one case, and was completed in the fifth case.

Of the eight cases six were operated on, but none remained free from recurrence.

Trotta† gives a case of his own and a list of 26 cases (occurring between the years 1879 and 1905) of cancer complicating pregnancy in the last three months, which had been operated on by Cæsarean Section, followed by total abdominal hysterectomy. The maternal mortality was 38 per cent., the foetal mortality 22 per cent.

Of the 15 patients operated on *in labour*, eight died and seven recovered, a mortality of 53·3 per cent. He compares the operation with vaginal Cæsarean Section, followed by vaginal hysterectomy, where the maternal mortality was 17 per cent., the foetal mortality 44 per cent.

\* 'Inaug. Diss.,' Zürich, 1907.

† 'Archiv di Ost. and Ginecol.,' April, 1906, p. 192.



The maternal mortality, after the abdominal operation, was thus more than double, while the foetal mortality was only half that of the vaginal operation.

Sarwey,\* in 1908, gave a list of 29 cases of the extended Wertheim operation, in all of which the mothers survived; 12 of these were advanced in pregnancy, and 10 of the children delivered by Cæsarean Section survived. The final results are not given. This list, of which the first case is Micholitsch's case, already mentioned, has been widely quoted. It certainly looks remarkable, but it must be remembered that it is made up of *published* cases (so far as known to Sarwey) between the years 1900 and 1908; if all the cases which had *occurred* had been published, it would have included Wertheim's case of death from embolism, operated on in 1905, and perhaps others.

Only the thoughtless will believe that it represents the mortality of the Wertheim operation, which, in Wertheim's own clinic, had a mortality of 16·6 per cent., and, even when not complicated with the Cæsarean Section required in these cases, has a death rate of about 18 per cent.

R. Vitanza† published in 1898 a paper on amputation of the cervix of the cancerous uterus during pregnancy.

Of seven cases seen, in three the cancer had spread beyond the cervix; these were delivered in two cases by the vagina, and in the third by Cæsarean Section.

In four of the cases the disease was limited to the cervix; these were all treated by high amputation of the cervix.

The first case, five months pregnant at the time of the operation, had a natural delivery at the eighth month, and subsequently had a second child, without recurrence of the growth. The second case, also five months pregnant, was delivered at the ninth month. The child lived two days; the mother had peritonitis, but apparently recovered. The third case was operated on without a suspicion of pregnancy; the patient went to the ninth month, and bore a living child; the mother was well six months later. The fourth case was six months pregnant. Labour occurred at  $7\frac{1}{2}$  months; the child lived and the puerperium was normal. There was no recurrence three months later.

Two years later, in the same journal, Vitanza published a paper

\* *Loc. cit.*

† 'Archiv di Ost. and Ginecol.,' 1898, p. 670; and 1900, p. 257.



on 33 cases of high amputation for cancer. Of these, 15 were early cases; only two recurred, and nine remained free from recurrence for three to 12 years, and in six of these pregnancy occurred from six months to three years after the operation. The Pacquelin cautery was used in all cases after the amputation.

The preservation of the foetus, and the possibility of pregnancy following high amputation, as shown by Vitanza's cases and one of mine, are valuable advantages of high amputation, which should not be overlooked in considering the question of treatment.

### *Treatment.*

The treatment of cancer of the cervix complicating pregnancy varies according as the case is "operable" or "inoperable" and the child is viable or not. The question of operability is usually decided by the absence of fixation of the uterus and of thickening in the parametric tissue, though operation, both vaginal and abdominal, permits the removal of the uterus in certain cases where these conditions are found. The age of viability of the child may be taken for practical purposes as in the last three lunar or two calendar months of pregnancy, in this paper called "advanced pregnancy," pregnancy of shorter duration being called "early pregnancy." In advanced pregnancy the interests of the child and the large size and vascularity of the uterus introduce special problems of treatment and increase the danger of the operation, which is especially great during the course of labour (see Trotta, *loc. cit.*).

### *Modes of Treatment.*

The chief modes of operative treatment which have been employed for cancer complicating pregnancy are by high amputation, vaginal hysterectomy, extended vaginal hysterectomy, abdominal hysterectomy, extended abdominal hysterectomy, and combined abdominal and vaginal hysterectomy.

In the course of the last ten years great advance has been made in the treatment of cancer of the cervix by radium, mesothorium, and X-rays, and for the last five years in several of the chief clinics of Europe, operation has been almost entirely abandoned in favour of radiation treatment. This method of treatment would seem to entail some risk to the foetus, and I am not aware that it has been employed during the course of pregnancy.



The patients are on the average younger, and therefore presumably stronger than non-pregnant patients, but the disease is apt to be more malignant in the young. The glands are, however, comparatively rarely affected (Wertheim, *loc. cit.*).

#### TREATMENT DURING "EARLY PREGNANCY."

(a) "Operable" cases should be operated on at once. The opinion once held that cancer complicating pregnancy was inevitably fatal can no longer be maintained. The best results have been obtained by the extended abdominal hysterectomy, Wertheim's results having been unequalled by any other method. In view of the fact that the glands are rarely affected, vaginal hysterectomy (preferably performed with the cautery) may be employed in feeble or fat patients, as it has a much lower mortality than the abdominal operation, and amputation of the cervix may be performed in early cases of squamous carcinoma, in which there is a desire to preserve the life of the child and the fertility of the mother.

During labour or abortion the same operations may be performed if the case is not infected; if infected, the whole womb should be removed.

(b) "Inoperable" cases.—If the case is not accompanied by bleeding or infection, the patient should be kept at rest and Porro's operation with the *serre-nœud* be performed when the pregnancy is "advanced." During labour or abortion the case should be treated on general principles, with a view of preventing infection, and subsequently treated during the puerperium with the cautery, radium, and X-rays.

#### TREATMENT DURING "LATE PREGNANCY."

(a) "Operable" cases should be treated by Cæsarean Section, followed by extended abdominal hysterectomy. If the patient is in fair condition, the operation is indicated equally on the ground of science and humanity.

If the patient is feeble or the growth infected, it might be preferable to remove the cervix by the cautery, and then remove the child by the vagina or by the abdomen, and apply radium after, or without, the removal of the uterus. This procedure would probably be safer to the mother than the performance of abdominal Cæsarean Section and the removal of the uterus (or the cervix after amputation) by the vagina, but would involve some



increased risk to the child. Vaginal Cæsarean Section entails too great a risk of implantation of cancer cells; and no case is recorded in which it has been followed by cure.

*During labour* the risk to the patient is greatly increased. In the early stages of labour Cæsarean Section, followed by the extended abdominal hysterectomy, will usually be the best treatment.

But if the labour be advanced and the growth not extensive, it may be safer to deliver the patient *per vias naturales*, and afterwards at an early period of the puerperium to treat the diseases by one of the methods mentioned. It is noteworthy that five of the seven advanced cases "cured" were operated on after delivery.

(b) "Inoperable" cases should be treated by Porro's operation with the use of the *serre-nœud*. It has the advantage over the conservative Cæsarean Section that it removes the placental site from the risk of infection, and over Cæsarean hysterectomy with intraperitoneal stump that, in case of infection, discharges will readily escape by the side of the wire, which can be placed at any height above the growth, provided the placental site be removed. In the case of a dead or putrid child it would be possible by the Porro method to close the peritoneal wound above and around the uterus before the body of the organ was opened or amputated.

*During the puerperium* the treatment does not differ essentially from the treatment of cases of cancer in the unimpregnated.

At the present time there is a great tendency abroad to treat these cases with radium, mesothorium, and X-rays, a reaction having set in against the extended abdominal hysterectomy on account of its high rate of mortality. The late Dr. Pozzi\* proposed a restricted vaginal hysterectomy completed by radium therapy in cases of cancer of the uterus. Although such an operation is unsuitable for some cases of cancer during pregnancy, I believe that in the puerperium vaginal hysterectomy, or high amputation performed with the cautery and completed by the application of radium and X-rays will be found to give better results than the extensive operations now usually practised.

The three cases of high amputation described in this lecture which have remained free from recurrence for 25, 22, and 19 years are instances of the possibility of cure by simple operations, which are free from danger. As far as I know only two other cases of cancer complicating labour in advanced pregnancy are recorded

\* 'Revue de Gynécologie,' vol. xxiii, p. 209, 1915.



which have remained well for 5 years after operation, viz., Olshausen's ( $5\frac{3}{4}$  years), and Von Ott's ( $8\frac{1}{2}$  years) both operated on by vaginal hysterectomy in the puerperium. Two additional cases in advanced pregnancy have been cured, viz., Micholitch's (5 years) and Aulhorn's (5 years) both operated on by the extended abdominal hysterectomy. The former was in advanced pregnancy but not in labour; no information as to the presence of labour was given in Aulhorn's case. I attribute the result in my cases to the use of the cautery (in two of the cases) and of antiseptic douches, and also to the fact that the operation was performed after delivery when the tissues were involuting.

The rarity of cure of cancer complicating labour in advanced pregnancy seems to justify the re-publication of these cases with a later after-history.

Sarwey in Veit's 'Handbuch der Gynäkologie,' while mentioning the title of my former paper in the bibliography, does not allude to the cases in the text. Perhaps the after-history of Case 5 may lead the next German writer on the subject to consider the cases worthy of mention.





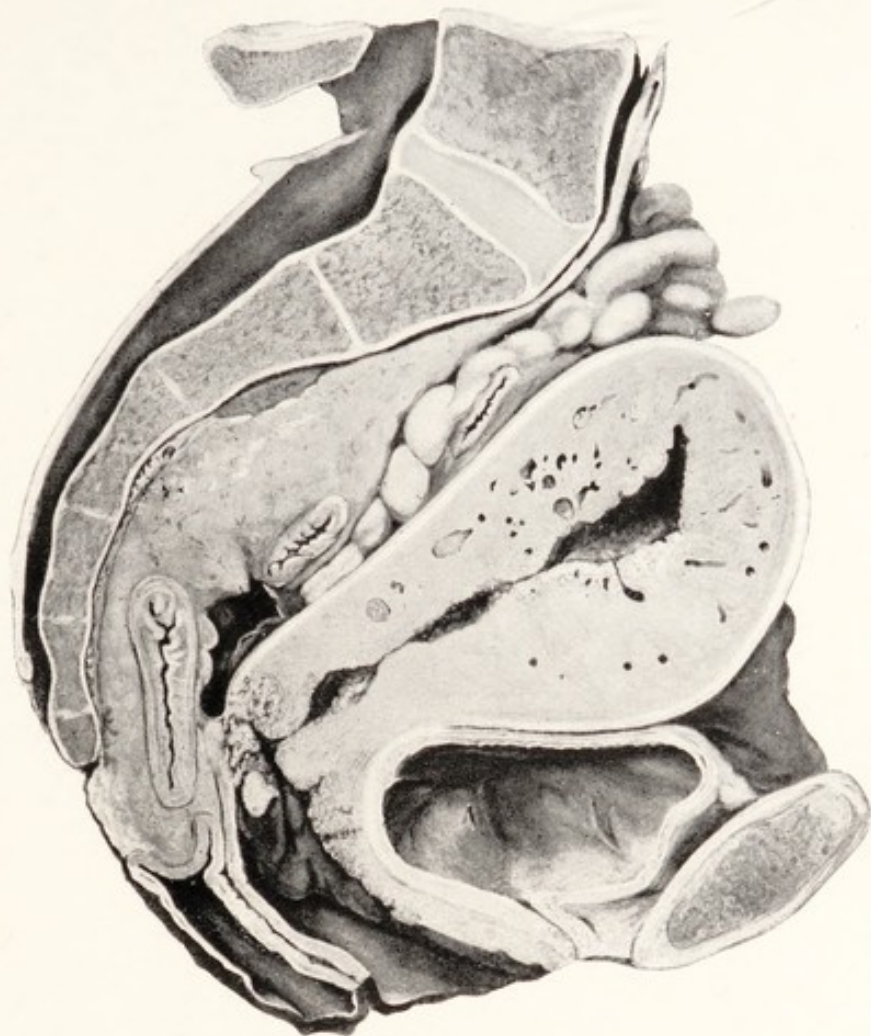


FIG. 18 (Case 2).—Median section of pelvis showing extensive cancer of cervix and vagina, and pus in wall of uterus. (Half natural size.)



FIG. 19 (Case 4).—Showing cancer of anterior lip, and placenta and cord protruding through tear in wall caused by volsella during vaginal hysterectomy with the cautery. (Half natural size.)









FIG. 20 (Case 5).—Squamous cell carcinoma of cervix. Sketch by author just before operation.  
(Natural size.) 'Obstet. Soc. Trans.,' vol. xlvi.

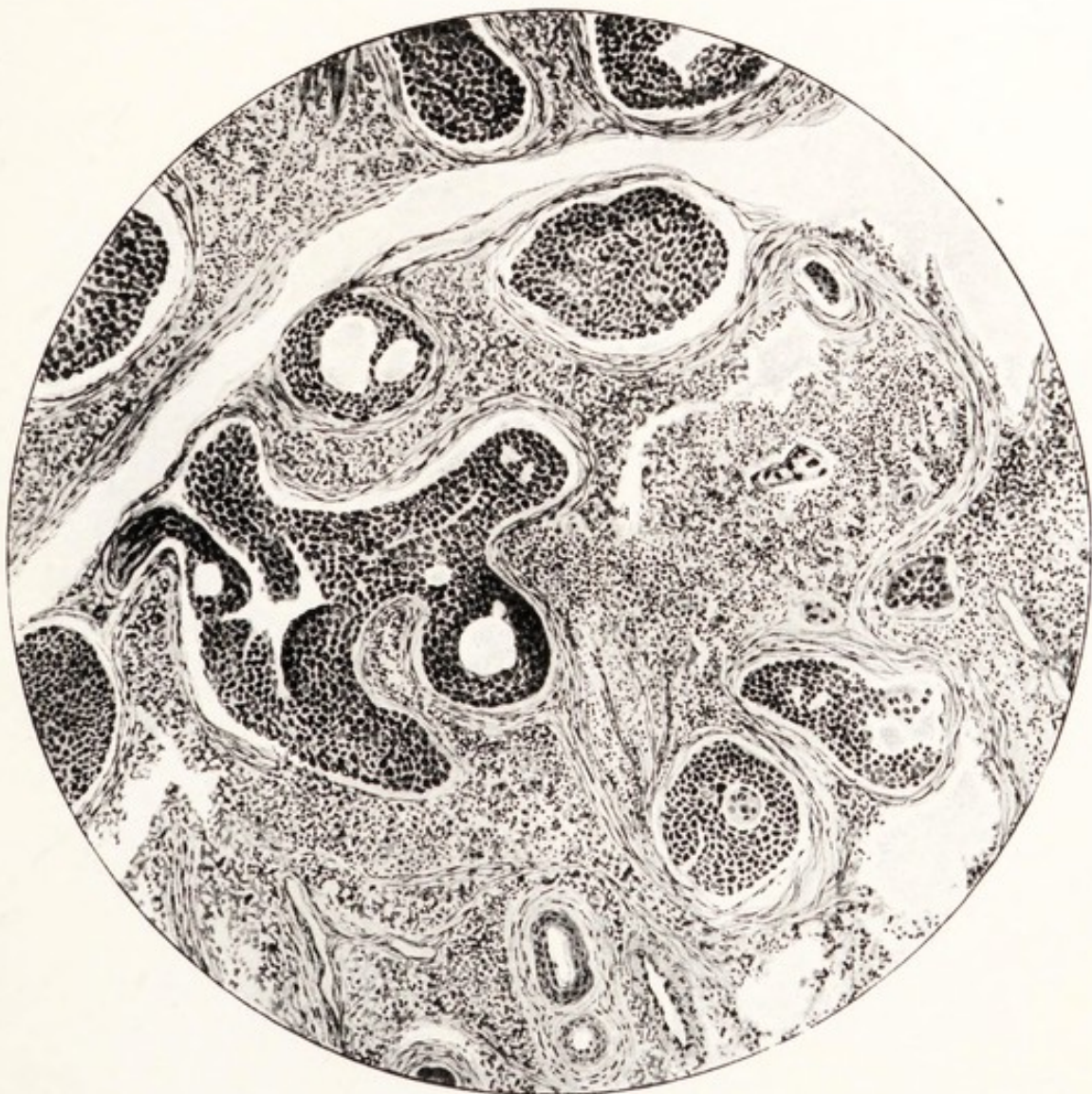


FIG. 21 (Case 5).—Squamous cell carcinoma of cervix. (Low power.) 'Obstet. Soc. Trans.,' vol. xlvi.









FIG. 24 (Case 6).—Higher power.



FIG. 22 (Case 6).—Squamous cell carcinoma of cervix. Sketch by author just before operation. (Natural size.) 'Obstet. Soc. Trans.,' vol. xlv.









FIG. 25 (Case 7).—Squamous cell carcinoma of cervix. Sketch by author of specimen which had been five years in spirit. (Natural size.) 'Obstet. Soc. Trans.,' vol. xlv.

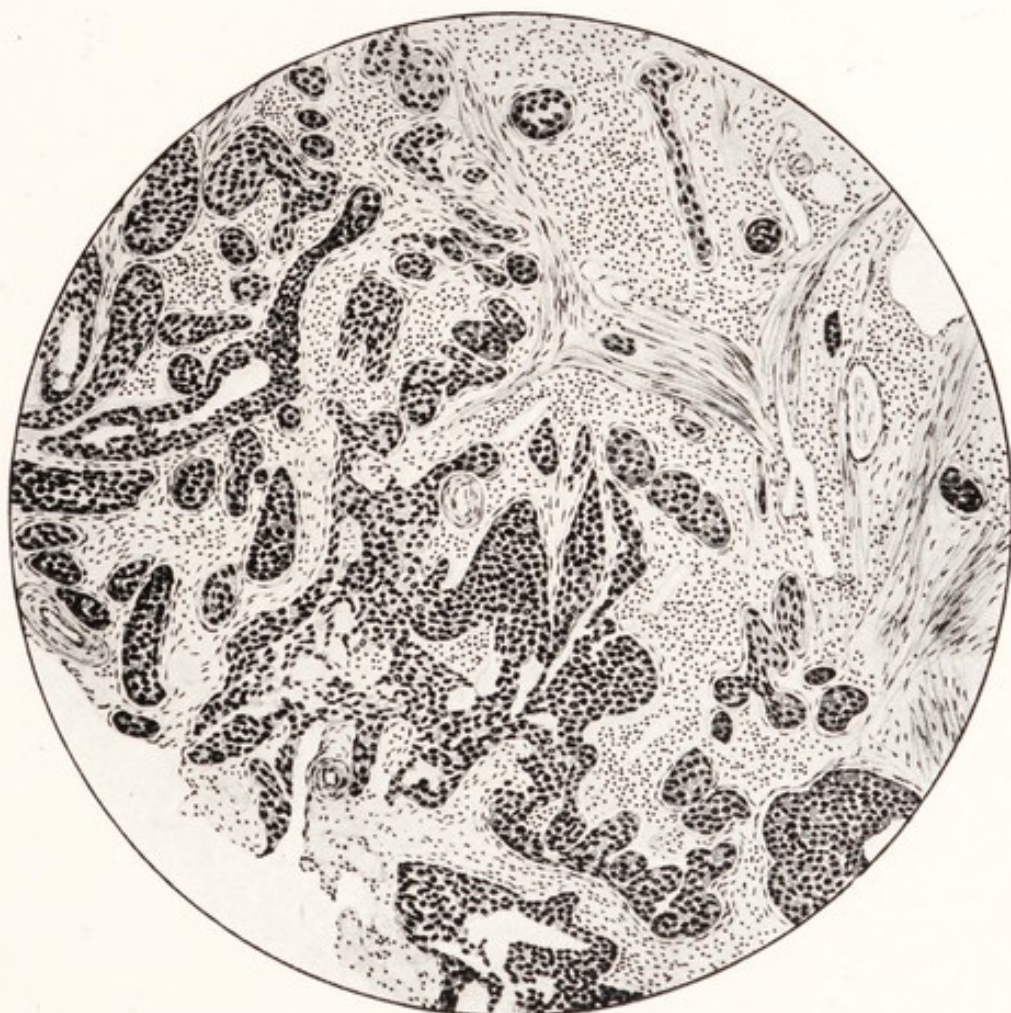


FIG. 26 (Case 7).—Low power.







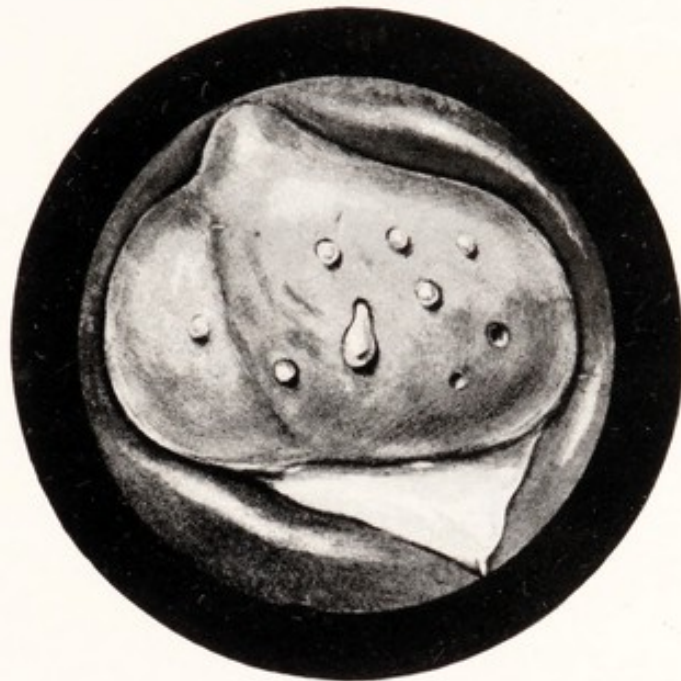


FIG. 27 (Case 9).—Showing unusual form of cancer of cervix complicating pregnancy, smooth on surface and pitted with holes discharging "pus," a pool of which occupies a tear in the posterior lip. The photograph, from a coloured drawing by the author, slightly exaggerates the smoothness of the surface. (Natural size.)



FIG. 28.—Showing hypertrophied papillary or nodular erosion simulating cancer. A small Nabothian cyst is seen in the anterior lip. (Natural size.)















