The Lettsomian Lectures

ON

TUMOURS COMPLICATING PREGNANCY, LABOUR, AND THE PUERPERIUM.

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON,
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(Abstract.)

LECTURE I.—FIBROID TUMOUR COMPLICATING PREGNANCY, LABOUR AND PUERPERIUM.*

THE notes of thirty-seven cases were given illustrating the following points: First, that in a large number of cases of small tumours patients pass through pregnancy and labour without difficulty. Even in the case of large tumours—some as large as an adult's head—no difficulty may arise. This is illustrated by eight cases. The danger of pedunculated reniform tumours becoming rotated and causing inflammation is illustrated by a case. Three cases of retroversion and retroflexion of the pregnant uterus produced by fibroids, one of acute antelexion, and two of inversion of the uterus were mentioned; in seven cases submucous tumours were removed after childbirth or miscarriage by enucleation through the os uteri. In these cases, although sepsis occurred, hysterectomy was not necessary. The lecture was illustrated by numerous diagrams made from tracings of tumours on glass, showing the evolution and involution of the tumours. Three fatal cases were described, one from nipping of the ileum between two pedunculated subperitoneal fibroids; the second from twisted infected subperitoneal reniform tumour; the third was infected with *Bacillus welchii*, and died of acute sepsis after Caesarean section. The after-histories were given in many cases, extending in some instances for periods as long as twenty-five years.

Frequency.

Fibroid tumours complicating pregnancy are quite common, though very divergent opinions have been expressed by eminent obstetricians on this point. I think it may be stated with an approximation to accuracy that fibroids occur about once in 150 pregnancies.

Age.

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 stated 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.

Fibroids rarely occur before the age of 25, and are practically unknown before puberty. The slow growth of these tumours, their occasional occurrence at an early age, and the severe dysmenorrhoea they cause years before they become manifest clinically have led to the suggestion that they are of congenital origin; but Essen-Möller has examined the uteri of 20 fetuses and sucklings, and I have examined the uteri of 100 stillborn girls without finding any sign of myoma.

Taking the ordinary period of woman's fertility at thirty years, we may recognize that in the first ten years during which she may become pregnant she is extremely unlikely to have a fibroid, and that only in the next twenty years is she liable to both. These facts invalidate most of the voluminous statistics of sterility and abortion in women with fibroids. These tumours have a certain influence in causing sterility and abortion, but it is slight. On the other hand there seems to be reason to believe that sterility favours the occurrence of fibroids, and that regular child-bearing and suckling to some extent prevent their occurrence.

Effect of Pregnancy on Fibroids.

When a patient with fibroids becomes pregnant the tumours usually increase in size owing to oedema, hypertrophy, and hyperplasia; the muscle cells become greatly

hypertrophied, often swollen and sometimes vacuolated and occasionally developed into large cells resembling the decidual cells of the endometrium (Gordon Ley). The development of the tumours varies; usually they enlarge; sometimes no increase is noticeable; occasionally they appear to diminish; 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 the pregnant uterus, 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; occasionally it 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, therefore, that infection of degenerated fibroids may occur from the blood stream. The ordinary route of infection by the vagina often leads to necrosis of submucous tumours. 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 alter in shape owing to their rearrangement in the emptied organ. The subperitoneal tumours sometimes do not diminish very markedly in the puerperal month. Their apparent rapid diminution is rather due to increased difficulty of examination.

CASE 12.—Large Fibroid: Natural Delivery: Slight Involution after Labour.

S. H., a nullipara, aged 36, had a large tumour in the upper right wall of the uterus. She had a slightly contracted pelvis. The diagonal conjugata being 4½ inches. On this account labour

FIG. 1.—Case 12. Immediately after labour; showing tumour larger than an adult's head. The dotted line shows distended bladder.

was induced by bougies and the patient was delivered naturally of a child weighing 8 lb. 1½ oz. Both mother and child recovered. The fibroid underwent only slight involution (from 9½ in. by 6½ in. to 8½ in. by 6 in.) in a fortnight after labour.

CASE 6.—Large Fibroids: Natural Delivery: Apparent Disappearance of Tumours Fourteen Years Later.

T., aged 42, married eight years, never previously pregnant. Was sent to me by Dr. Pearse 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

* Delivered February 2nd. The full text contains notes of 37 cases.

fibroid about as big as a fetal head and a larger one as big as a cocoa-nut in the right cornu (see Fig. 2).

The child, a girl, was delivered alive (a breech presentation) by Dr. Pearse on October 2nd, 1905. The mother made an excellent recovery. The uterus contained such a large mass of fibroids that on the fourteenth day of the puerperium it

FIG. 2.—Case 6. Showing two large fibroids.

measured 10½ in. transversely and reached up for 1½ in. 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."

Since 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 haemorrhage is very rare; the two cases I have met with occurred in nulligravidae.

Torsion of pedunculated tumours sometimes occurs; it is especially liable to happen in the kidney-shaped tumours with pedicle at the hilum (see below). It is a dangerous accident; three out of twenty-one cases collected by Troell and one out of my three cases terminated fatally. This torsion may be transmitted to the uterus and even to the vagina.

Effect of Fibroids on Pregnancy.

Ectopic pregnancy is rarely met with. Troell, in 1910, found forty-nine cases of tubal pregnancy recorded in literature, but one case (Harley's) must be excluded, as the specimen, which is in University College Hospital museum, shows that it was an instance of ruptured uterine horn. I am, however, able to show two specimens of ruptured tube from the same museum.

Placenta praevia is said to occur with unusual frequency in the presence of uterine fibroids. Such a combination was observed in the following case:

CASE 32.—Submucous Fibroid: Placenta Praevia: Sepsis: Removal of Tumour: Recovery.

A. C., aged 35, married, had had one pregnancy, resulting in the birth of a living child, eleven 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 haemorrhage (placenta praevia). Version was performed and a living child delivered. During the following week she had several attacks of shivering with high temperature (104°). I saw her in consultation on the eleventh day; the uterus was large and hard and reached 8 in. above the pubes. On examination through the os uteri a submucous fibroid as big as a fist could be felt on the right side. An offensive bloody discharge was present.

Vaginal douches of iodine solution were given, and on July 30th the cervix was dilated with 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 (3j to Oj) and the uterus replaced. Iodoform gauze was packed in the uterus for a few hours. The tumour weighed 1 lb. 3½ oz. It was dull red in colour, and in

parts was covered with a yellowish-green slough. The operation lasted thirty-five minutes.

The temperature, which had varied from 104° to 100° before the operation, reached 100.8°, 100.8°, 101.6°, 103° 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.

FIG. 3.—Case 32. Showing sloughing submucous fibroid eleven days after labour.

It is probable, however, that haemorrhages due to submucous fibroids or to the insertion of the placenta upon them are sometimes erroneously attributed to placenta praevia. The following case is an example of this occurrence:

CASE 31.—Submucous Tumours: Removed after Childbirth by Enucleation through the Os Uteri.

In the outdoor maternity of University College Hospital in 1897 a submucous fibroid measuring 5 cm. by 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 haemorrhages 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.

It is to be noted that in such a case as this the haemorrhage may lead to the discovery of the tumour.

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. I have never met with the "unbearable pain" which some authorities have given as a justification for performing hysterectomy in early pregnancy. 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 oedema of the lower limbs; albuminuria is not uncommon, and ascites may occur. Abnormal presentations, breech especially, are frequently met with. The labour is often surprisingly easy in view of the advanced age of many of the patients. Even in the case of tumours encroaching on the brim it is found that the tumour is often drawn up 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 (as in Case 31 reported above), and post-partum haemorrhage, if submucous tumours are present, may be severe. The following is an example of retention of decidua after a miscarriage:

CASE 35.—Miscarriage: Sepsis: Enucleation of Submucous Myoma and Removal of Decidua: Recovery: Twenty Years Later Death from Sarcoma.

On October 24th, 1898, at 11 p.m., I saw with Dr. Webb of Netley a lady, aged 34, suffering from fever (temperature 100°, pulse 120) and foul discharge after a miscarriage which had occurred six days previously at the second month. A consultation had been held and the finger had been passed into the uterus, the lining of which was smooth, but 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 mercury perchloride 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 haemoptysis, and other signs of growth in the lungs. From the cachectic condition, the haemorrhages, and foul discharge it appeared probable that the growth was a uterine sarcoma. She gradually wasted, and died in February, 1918, nearly twenty years after the enucleation of the fibroid.

The following is a remarkable instance of the value of conservative treatment in a case of pregnancy complicated with large tumours:

CASE 7.—Multiple Fibroids causing Obstruction (sixth week) and Albuminuria (eighth month): Induction of Labour: Mother and Child Living Twenty Years Later.

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 on July 1st, 1894. A few days

FIG 4.—Case 7. The larger figure shows the size of the tumour at the sixth week of pregnancy; the smaller figure shows the size of the uterus twenty years later.

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.

Menstruation began at the age of 11, and was regular except at the age of 19, when it stopped for thirteen 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 Caesarean section performed. The urine was found to contain a large quantity of albumin. 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 eight and a half 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.

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, in which 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 with regard to 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 corner—a lop-sided 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 on rectal examination. 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 in diagnosis are sometimes 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 characterize it. On the other hand, a degenerated fibroid uterus, by its consistence and livid appearance, may closely simulate a pregnant uterus with its contained fetus, but the certain signs and the breast changes are, of course, 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. 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 fetus do, and they may become more marked during uterine contractions, which obliterate the fetal parts; at most the tumours have a slight mobility, but return to the same position even when repeatedly examined. A large sub-peritoneal or intramural growth or small multiple growths may render the palpation of the fetus 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, as in the following case:

CASE 30.—Miscarriage: Intramural Fibroids: Recovery: Caesarean Section in subsequent Pregnancy: Acute Sepsis (Infection of Tumour): Death.

A. S., aged 42, married in 1934; no children, one abortion (December, 1914); had been an in-patient on December 17th, 1914, at University College Hospital for incomplete miscarriage of about nine weeks, brought on by the use of abortifacients. The retained decidua was putrid, and on removing it an intramural myoma as large as an orange was found in the anterior wall of the uterus. An iodine douche was given, and gauze applied for twelve hours as bleeding was profuse. She recovered well, though the temperature was raised to 100° on three occasions up to the ninth day and up to 99.6° on the thirty-second day; the pulse also varied from 80 to 96.

She was advised to submit to Caesarean section if she became pregnant again. Accordingly she was admitted to University College Hospital on February 21st, 1917; she was in good condition and near the term of pregnancy. The child was lying obliquely with 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—10½, 11½, 8 in. The temperature was very slightly raised (99.4° on admission), but afterwards, till the operation, only twice reached 99°; 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 forty seconds, and survived. The operation lasted fifty-two 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; and thirteen and a half 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, sixty hours after the operation, at 1.30 a.m., she died. She vomited repeatedly, but this 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.

Post-mortem Examination.—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.

A degenerated and cystic fibroid may closely resemble an ovarian tumour, and sometimes cannot be distinguished from it, as in a case I recorded in the *Obstetrical Society's Transactions*, vol. xlv.

CASE 15.—Large Degenerated Fibroid.

On July 5th, 1901, I removed from a patient, aged 41, from the left broad ligament during labour, a tumour of which the solid part weighed over 17 lb. and was a foot in diameter. 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 had first noticed considerable enlargement of the abdomen two years earlier, but always noticed that the abdomen did not go flat after the labour.

In the following case a reniform tumour at the fourth month was diagnosed as a dermoid. Torsion had occurred.

CASE 16.—Reniform Fibroid: Twisting of Pedicle: Septic Thrombosis: Death.

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 haemorrhage owing to the vascularity of the pedicle; but the haemorrhage was stopped by under-stitching with fine silk. The patient progressed fairly well for two days, then had suppression of urine, secreting only 1½ oz. in sixteen hours, the urine containing one-third albumin 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 11½ by 7 by 6 cm. The raw surface of attachment was at the "hilum." The section showed numerous haemorrhages into the tumour and green patches near the surface. There was a small tag of lymph on the surface.

A 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 anaesthesia 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, leading 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 subperitoneal and intramural 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 haemorrhage 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 intramural tumour mistaken for a second twin; in that case the hardness of the tumour and the absence of signs of the fetus rendered the diagnosis easy, but were the tumours degenerated, considerable difficulty might arise; it would be overcome by exploration through the cervix.

A fibroid impacted in the pelvis, especially if cystic, may closely resemble an ovarian cyst, and a subperitoneal fibroid after abortion may resemble a tubal mole, but is to be distinguished by its hardness. Inversion of the uterus may occur, 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.

Prognosis.

The prognosis is in the great majority of cases good when the patients are attended with judgement, and careful regard is paid to sepsis. The three fatal cases here published, which are all that I have met with, are examples of dangers which sometimes arise. The first

TABLE A.—Author's Cases treated by Abdominal Myomectomy.

No.	Age.	Children.	Abortion.	Date of Operation.	Adhesions.	Tumour.	Remarks.
1	41	4	0	July 5, 1901	To omentum and broad ligament	Cystic myoma 1 foot in diameter, solid part over 17 lb., and several pints of fluid.	Operation during labour. Mother recovered; child dead before operation. (Case 15.)
2	30	0	0	March 5, 1906	To omentum	Pedunculated twisted reniform tumour attached by hilum just internal to right round ligament, 11.5×9×5 cm.; vascular, degenerated, adhesions on surface.	Operation three weeks after abortion at fifth or sixth week. Mother recovered. (Case 17.)
3	27	0	0	March 20, 1906	No	Pedunculated twisted reniform tumour attached by hilum just internal to left round ligament. (See text.)	*Operation at fourth month of pregnancy. Patient died on third day. (See text, Case 16.)
4	26	0	0	November 11, 1911	To omentum	1 lb. 1 oz., 7.5 cm. in diameter, pedicle 3.7 cm. thick, lymph on surface; necrobiotic; sterile.	Operation at eleventh week of pregnancy. Child, 7 lb. 15½ oz., born 272 days after marriage; vertex presentation. Patient recovered. (Case 14.)
5	29	2	0	July 24, 1913	To omentum and abdominal wall at navel	3½ oz., 7.5×5×4.5 cm., calcified and degenerated.	Operation at sixth week of pregnancy. Child, 6 lb. 10 oz., delivered naturally; vertex presentation, March 10, 1914. Patient recovered. (Case 13.)

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

No.	Age.	Children.	Abortion.	Date.	Adhesions.	Fibroid Removed.	Remarks.
1	34	0 (married 5 years)	0	March 1, 1907	No	No	Fibroid size of lemon in left lower segment; generally contracted pelvis; healed tubercle of sacro-iliac joints and pelvis.
2	31	2	0	Jan. 8, 1916	No	No	Fibroid size of grape right upper anterior wall; contracted pelvis. Several small fibroids found on December 14, 1918, when Caesarean section successfully done for the fourth time (H. R. S.).
3	42	0	1	March 1, 1917	No	No (a small submucous tumour removed)	Degenerated infected myoma of lower segment. <i>Bacillus welchii</i> in tumour. The patient died of acute sepsis in sixty hours. (Case 30.)
4	25	0	0	March 17, 1917	No	No	Pelvis contracted 3½-inch conj. vera; two fibroids size of grape and marble at back of uterus.
5	38	1 (dead; forceps)	1	Feb. 8, 1918	No	No	Pelvis contracted (3½-inch conj. vera); one child delivered dead with forceps (difficult); small fibroid in anterior wall.

All the mothers recovered except No. 3; all the children were living.

TABLE C.—*Author's Cases of Pregnancy complicated by Fibroids treated by Caesarean Section followed by Abdominal Hysterectomy.*

No.	Age.	Children.	Abortion.	Date.	Adhesions.	Nature of Operation.	Remarks.
1	28	0	1	May 14, 1892	No	Porro's operation (299 days after last menstruation)	(See <i>Obstet. Soc. Trans.</i> , 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 lb.
2	28	0 (married 5 years)	0	March 18, 1905	A few around ruptured tube	Caesarean section + total abdominal hysterectomy	(See <i>Obstet. Soc. Trans.</i> , vol. xlviii, p. 240.) Patient in labour. Footling presentation; membranes ruptured 8 hours; urine highly albuminous; ascites. Uterus 6 lb. 2 oz.
3	38	0	0	March 29, 1908	Of pedunculated fibroid to Douglas's pouch	Caesarean section + total abdominal hysterectomy	(See <i>Proc. Roy. Soc. Med.</i> , 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. Child dead before operation.
4	37	3	1 (induced at 6½ months)	July 10, 1909	No	Caesarean section + total abdominal hysterectomy	(See <i>Proc. Roy. Soc. Med.</i> , 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.
5	40	0 (married 9 years)	0	October 12, 1914	No	Caesarean 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 23.)
6	42	0 (married 3 years)	0	Sept. 30, 1916	No	Caesarean section + total abdominal hysterectomy	Operation for fibroids and contracted pelvis; head presentation. Conjugata vera 3½ inches. Fibroid 3½ inches in diameter, 2½ inches thick in lower segment to level of internal os. Mother and child well in 1919. (Case 28.)

All the patients recovered; children all living except No. 3, which was dead before the operation.

death, from intestinal obstruction due to nipping of ileum between the 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 contraindicated. 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 in which the fetus 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 haemorrhage 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 Caesarean 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 haemorrhage or infection is rarely called for.

Myomectomy and hysterectomy in early pregnancy are frequently performed by some gynaecologists. An im-

portant monograph by T. Landau¹ on myoma and pregnancy is illustrated by many fine plates of fibroid uteri containing little fetuses, sacrificed in some cases, it appears to me, unnecessarily by the operation of hysterectomy. He gives a list of eleven 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. He gives also 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 myomectomy terminated in hysterectomy. One of the mothers died, the others were, of course, sterilized 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 had 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 Caesarean section may be performed.

Conservative Caesarean section 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 primiparae. 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 nineteen times during early pregnancy, does not record a case of conservative Caesarean section.

My five cases are given in Table B. In all of them contractions 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.

Caesarean Section followed by Abdominal Hysterectomy.

Landau performed the operation in two cases only; the mothers and one child recovered; of the other child it was 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 twenty cases (including two of mine) operated on since 1900, with two deaths. I am able to add three more cases (Table C, Nos. 4, 5, 6), making twenty-three cases with two 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.

REFERENCE.

¹ T. Landau: *Myom bei Schwangerschaft, Geburt und Wochenbett*. 1910.

PENETRATING WOUND OF CHEST: THORACOTOMY: SUTURE OF PERICARDIUM.

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THE following case seems of interest as throwing light on the question whether it is necessary to close a large traumatic communication between the pericardial and pleural cavities. Wounds of the pericardium are rare, and almost impossible to diagnose with certainty.

During the late war much advance was made in thoracic surgery, but the indications for operative interference are not so definite as in corresponding cases of abdominal injury, the reason being that many cases of wounds of the thoracic viscera recover without operation—a very rare event in a wound of a hollow viscus in the abdominal cavity.

In the following case the only factor which might have suggested a diagnosis of injury to the pericardium was the

direction of the track of the shell fragment between the entrance wound and the position of the fragment as shown by x ray (see diagram).

Pte. H. T., aged 19, was wounded by a piece of high explosive shell at 3.30 a.m. on June 25th, 1918. He was admitted to No. 1 Canadian Casualty Clearing Station under my care at 9 a.m. He was cold and collapsed, with marked dyspnoea, and complained of severe pain in the right side of the chest. There was a small ragged wound over the second left intercostal space, about half an inch from the margin of the sternum. The right side of the

chest was absolutely dull on percussion. The pulse was 120. He was put to bed in the resuscitation ward, given morphine gr. $\frac{1}{2}$, atropine gr. $\frac{1}{80}$, and warmed up by an electric cradle.

At 1 p.m. he was warm, but his condition was otherwise unchanged; the pulse was 124. Examination of the chest with the screen revealed a shell fragment about the size of a raisin (see diagram), 6 cm. deep from the anterior wall of the chest. It did not move on respiration. There was dense right haemothorax, and the right side of the diaphragm hardly moved. The left chest was clear.

Operation.

A 7-inch incision was made (at 2.30 p.m.) over the fifth right rib and costal cartilage, commencing about one inch from the

middle line in front. It was carried down to the bone, and the periosteum elevated from the rib. The rib and costal cartilage were split for the length of the incision by a Hey's saw and the parietal pleura divided by scissors. A rib separator was introduced and the chest widely opened. A large haemothorax was evacuated and some large blood clots wiped out with gauze. The right lung was collapsed, and a tear, which was bleeding, was found at the lower part at the junction of the anterior and basal borders. This was sutured with fine linen thread.

On inspecting the lateral wall of the mediastinum a tear in the pericardium, about two inches in length from above downwards, was seen, through which was protruding the right auricular appendix and part of the right auricle. This was closed by a continuous suture of fine linen thread, but with considerable difficulty, owing to the extremely rapid beating of the heart and the attempts of the auricular appendix to get outside the pericardium at each beat.

A rapid search was made for the fragment of shell, but, owing to the patient's condition, was not prolonged, and it was not found. The pleura and two halves of the rib were brought into apposition by five or six sutures of thick chromicized catgut passed round the whole rib and securely tied. The muscles were united and the skin incision closed.

The entrance wound, which was dirty and ragged, was incised and packed with gauze. Gas and oxygen had been administered most skilfully for fifty minutes by Major R. Henry. After the first twenty-four hours, during which the patient was rather "shocked," progress was satisfactory. The stitches were removed on the tenth day, and the wound had healed per primam.

After-History.

On July 8th, twelve days after operation, he was not so well, and for two days he had had an evening rise of temperature, 101°. I asked Captain John Tull, C.A.M.C., medical specialist of the unit, to see him, and he reported as follows:

Heart.—Palpable friction over body of heart; dullness extends from right sternal border to $\frac{1}{2}$ in. outside left mid-clavicular line. Cardio-hepatic angle not widened. Both sounds clear. To and fro harsh friction audible all over precordium.

Lungs.—*Right:* Dullness and general flatness from middle of scapula to base; signs of fluid; aegophony. *Left:* Dullness for hand-breadth at base; signs of fluid.

We aspirated 20 oz. of clear straw-coloured fluid from the right pleural cavity. Culture sterile.

On July 13th Captain Tull reported:

Heart.—Dullness has increased during past few days, and now extends from $\frac{1}{2}$ in. to right of sternum to 1 in. outside left mid-clavicular line. Sounds are well heard. Precordial friction is much less distinct. It is probable there is moderate effusion into pericardial sac. *Lungs.*—*Right:* Fluid has reaccumulated in right pleural sac; now extends from mid-scapula to base. *Left:* Signs of fluid from lower border of scapula to base.

On July 14th straw-coloured fluid 15 oz. was aspirated from the right pleural cavity. This caused much distress. Culture: a few Gram-positive cocci.

On July 18th clear fluid 16 oz. was aspirated from the left pleural cavity. No culture was obtained.

On July 22nd he was very greatly improved, and in our opinion fit to travel. At the time there was great pressure on the available beds, and he was evacuated to the base.

Present Condition.

In February, 1919, he was demobilized, marked category B3, and I have a letter from him written in August, 1919, to say that he is working as a platelayer on the railway, and his only complaint is some shortness of breath on exertion. The shell fragment is still *in situ*.

Dr. T. S. Lister of Sandal, Wakefield, has very kindly sent me the following notes:

"I saw him yesterday; he is looking well and strong, and is working on the railway. Long scar of incision extending across the right side of the chest over the fifth rib. This is healed and healthy. Scar 3 in. long over front of second intercostal space on left side.

"Cardiac apical dullness extends to half an inch internal to left nipple line. No appreciable dullness on right side of sternum. The first heart sound at the apex is weak. Liver dullness in right nipple line extends to sixth rib. Dullness on posterior surface normal. Breath sounds are normal both sides. Vocal resonance no appreciable difference on the two sides. Expansion of chest is good and normal. He has slight shortness of breath on exertion."

Gask and Wilkinson have laid down indications for early operation in cases of penetrating wounds of the chest, but this case did not present any of those indications, and the first point that will suggest is, Would recovery have occurred without operation? As far as the injury to the lung and the haemothorax are concerned, aspiration would in all probability have been sufficient. As to the rent in the pericardium, I venture to think that closure was essential for the following reasons:

1. Prevention of spread of infection or fluid into the pericardial sac. Immediate closure of other serous cavities has been found to be the best method of treatment in cases of early infection.

2. Mechanical. The contraction and adhesion of the rent in the pericardium to the auricle might have caused grave cardiac symptoms.