Fibro-myoma of the uterus in pregnancy, with special reference to myomectomy

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FIBR'O.-MYOMATA IN PREGNANCY
with Special Reference to
MYOMECTOMY.

The frequency with which women conceive and the
frequency of uterine fibro-myomata easily explain why
the occurrence of pregnancy in a fibro-myomatous uterus
is not such an unusual phenomenon, though the percentage
of pregnancies complicated by fibroids is quite small.

Pinard collected 13814 cases of pregnancy in
the Clinique Bandelocque, of these 85 were complicated
by fibro-myomata, which gives a percentage of .62.

Bland-Sutton divides the menstrual epoch into three
periods, viz: -

(1) From 15th to 25th year, in which a woman is
more liable to conceive than to grow a myoma,

(2) From 25th to 35th year, during which period her
liability to pregnancy is greater than in the preceding
period, but her liability to myomata is also
greater.

(3) From the 35th to 45th year, during which her
liability to conception is diminished, but that
for myomata is immensely increased.

The subjects of such a combination are therefore
usually past the age of 30. This is very well borne
out by my list of 109 cases of myomectomy during
pregnancy. Of the 69 cases in which the ages were
recorded 54 were either 30 years of age or more.
The combination is also exceptionally common in
primiparae as demonstrated by Pinard's 85 cases of which 83 were primiparae.

Fibro-myomata a cause of Sterility.

Most authorities are agreed that fibroids cause sterility. There are several reasons for this:—

(1) The hypertrophic endometritis they produce renders the endometrium unfit to receive and nourish the ovum. The degree of endometritis varies in direct ratio with the proximity of the tumour to the uterine mucosa, so that it is more marked in submucous and interstitial fibroids than in subserous. Olshausen states that an interstitial fibroid the size of a third or fourth month pregnancy forms an absolute bar to the occurrence of pregnancy.

(2) They cause adhesions and other pathological changes in the appendages and prevent conception.

In 934 cases of hysterectomy for uterine myoma collected by Kelly and Cullen the tubes were normal in 482, i.e., 48.4% were diseased.

Twambly states that in at least 50% of interstitial fibroids the tubes sooner or later become diseased, the commonest pathological changes being adhesions, hydrosalpinges, chronic salpingitis, and pyosalpinges.

Fibroids may also be complicated by / ectopic gestation as pointed out by Dr. E. Taylor.
Of 19 cases of tubal pregnancy reported by Noble 6 were complicated by fibroids.

They may so displace the cervix that it is not bathed in seminal fluid.

Of 842 cases of married women with fibroids collected by Kelly and Cullen 277 were sterile, i.e., 33%. This figure nearly agrees with that of Olshausen, viz., 30%, while Martin estimates that 50% of myomatous uteri are sterile.

Of the women suffering from fibroids and who do bear children very few have large families. Winckel states that 41% of such women are uniparae, and his statistics show that 2 children is their average family.

**Fibroids are a Cause of Abortion.**

The reasons for the frequent occurrence of abortion in the myomatous uterus are closely associated with those of sterility and may be given as:-

(1) Hypertrophic endometritis which is most marked opposite the site of the fibroid. When the placenta is situated directly over this area its nutrition is so interfered with that it atrophies and abortion follows.

(2) Defective distensibility of the uterine walls which is most marked in interstitial fibroids.

(3) The limitations of space of the uterine, pelvic, or abdominal cavity which interfere with the enlargement of the uterus.
When the tumour is situated in the posterior uterine wall this interference with the uterine enlargement is still further increased.

Winter treated 14 cases of fibroid pregnancy by expectant measures, and of these 5 aborted, i.e., 35.7%. As in normal pregnancy the ratio of abortion is from 15% to 20% his statistics clearly indicate that abortion is more common in fibroid than in normal pregnancy.

The Dangers arising from the association of fibroids with pregnancy.

The dangers arising from the association of fibroids with pregnancy commence early in gestation, increase during parturition and are not ended with the completion of that process.

In Pregnancy

The dangers and complications arising during pregnancy are numerous and may arise either directly from the presence of the tumour itself, or indirectly from pressure on vital organs. They are (1) Torsion of the pedicle which is comparatively a rare complication; it occurs especially in the first half of pregnancy. The predisposing factors are length and thinness of the pedicle, lateral insertion of the pedicle into the uterus, large size of the tumour, ovoid or reniform shape, and non-central insertion of the pedicle into the tumour. The determining causes are tumours in the.
vicinity of the fibroma acting as mechanical causes of
torsion, and distension of the bladder or bowel. As a
result of torsion the growth may undergo any sort of
degeneration. Slow torsion causes a change in the
position of the tumour, lessened mobility, a relatively
rapid increase in size, softening and tenderness.

Generally it occurs quickly and is accompanied by
severe pains and collapse sometimes ending in peritonitis
and death which may be preceded by abortion.

(2) Torsion of uterus. This also is a rare complication
and occurs in large interstitial myomata of the fundus
as a result of attempts of the tumour to accommodate
itself to its surroundings, and when once twisting has
started it tends to increase. Professor Bastianelli
reported a case where the torsion was so extreme that
the fundus was completely separated from the cervix.
The complication causes severe abdominal pain and
almost invariably ends in abortion.

(3) Abortion. This is one of the gravest and most
frequent complications of fibroid pregnancy, the risks
being haemorrhage and sepsis.

Haemorrhage is due to the interference of the tumour
with the normal uterine contractions which hinders the
closure of the uterine sinuses.

Sepsis is due to retained products resulting from
interference with the regular concentric shrinking of
the placental site, or it may result from injury and infection of the tumour during delivery. Lefour found of 39 cases of fibroid pregnancy which aborted 14 died as a result of abortion, i.e., a mortality of 36%. Tarnier lost 4 mothers and 4, i.e., a mortality of 66.6%, in 6 cases of fibroid pregnancy terminated by forceps. Sänger reports a mortality of 83.7% in 45 cases, and Pozzi a mortality of 66% in 28 cases.

(4) Adhesions to adjacent organs. These are a result of attacks of local peritonitis caused by twisting of the pedicle or by infection or degeneration of the tumour. When between the bowel and tumour they lead to obstinate constipation, and are one of the most frequent causes of the pain associated with fibroid pregnancy. They become a source of danger when in replacing a malposition of the gravid uterus a vein in the adhesion is torn across causing internal haemorrhage.

(5) Degeneration and infection of the tumour.
Degeneration of a fibroid is often associated with pregnancy apart from septic infection (Bland-Sutton) and in "characterized by oedema and pigmentary changes from haematic staining which gives the tumours the appearance of hepatisation" (Foultauin). In fibroids uncomplicated by pregnancy degeneration takes place in 20% and the change is more common when pregnancy is present (Martin) and when the tumour is pedunculated. There is a form of degeneration described by Fairbairn which he called Red Degeneration which seems to be
specially related to pregnancy. In this type of degeneration the fibroid assumes a deep red or mahogany tint. The change is not due to an increase of muscle fibre but shews blood pigment diffused through the necrotic tissue of the tumour. The best marked cases of this type of degeneration are seen in pregnancy. Fairbairn gives the frequency with which these tumours occur in pregnancy as 40% while Winter makes the figure as high as 53%.

(6) Pressure Symptoms. These are due partly to increase in the size of the uterus and partly to increase in the size of the tumour caused by the more abundant blood supply during pregnancy; hence interstitial fibroids and fibroids near the placental site grow more rapidly than pedunculated and those at a distance from the placenta.

Pressure symptoms are also more pronounced when the fibroid develops below the pelvic ovum having its origin in the supravaginal portion of the cervix or in the lower part of the body of the uterus.

The symptoms may be general or local. Of the general symptoms the most common are restlessness, insomnia, dyspepsia, flatulence, nausea and vomiting. The local symptoms will largely depend on the site of the tumour. When situated anteriorly they cause difficulty of micturition from pressure on the uretha, or frequency of micturition from pressure on the fundus of the bladder.
When in the posterior wall they press on the rectum causing irritability of the rectum or constipation and difficulty in defaecation. Pressure on the sacral nerves results in constant pain in the back and legs, while interference with the pelvic circulation causes varicosity and oedema of one or both legs, rectum, vagina and vulva. When the tumour is situated in either broad ligament it presses on the ureter, but owing to the distensibility of this organ the pressure only very rarely leads to pyelitis and hydronephrosis.

Haemorrhage. When present in sufficient amount causes anaemia and a depressed state of health which favours the development of thrombosis. When it is accompanied by painful uterine contractions it indicates the irritability of the uterus which renders the expulsion of the ovum probable, and when it occurs periodically it increases the difficulties of the medical attendant to diagnose the condition.

Continuous and persistent pain is caused in several ways and constitutes the commonest indication for operation.

It may result from impaction of the uterus or growth within the pelvis and consequent pressure.

It may also result from torsion of the pedicle of fibroid or rotation of the uterus when large tumours occupy the anterior or posterior uterine wall.

Further it results from peritonitis caused either
by twisting of the pedicle or by necrobiosis of the
tumour. A necrobiotic tumour is often a painful tumour,
for instances have been recorded where the pain was
intense, and where no other cause for the pain was
found at the operation.

(9) Cardiac degeneration. There is an important
relationship between fibromyomata in pregnancy and
cardiac degeneration. This is brought about by the
rapid enlargement of the uterine tumour which interferes
with the freedom of the heart and lung action, and by
its pressure on large vessels throws an additional strain
on the heart. Of 22 cases collected by Roger Williams
ten showed pathological changes in the form of valvular
disease, fatty degeneration, and hypertrophy with
dilatation.

The influence of fibromyomata on the foetus is
slight. One might imagine that a large submucous
or interstitial tumour would tend to produce marked
deformity of the foetus, but owing to the extreme
softening which takes place in the tumour any such
deformity is a rare occurrence.
Dangers and complications in labour.

The mortality in the labour of fibroid pregnancy as given by different authors varies between very wide limits. Thus Gusserow gives a mortality of 53% of the mothers and 66% of children. Lefour and Nauss give the maternal mortality as between 50% and 60%.

At the other extreme we find Pinard of whose 84 cases labour ended spontaneously in 54. In the remaining 30 that needed artificial help the maternal mortality was 3.6%.

Winter in a series of 69 cases gives a maternal mortality of only 2%.

This discrepancy is to be accounted for not only by the skill of the obstetrician but also by the type of case.

The gravity of the complication is regulated by two factors, viz., the size of the tumour and its position. Tumours in lower uterine segment being far more dangerous than those in the upper.

The commonest complications met with are the following:

(1) Malpresentations. The following table taken from Olshausen shows the frequency of abnormal presentations in fibroid pregnancy:

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Fibroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertex</td>
<td>95%</td>
<td>54%</td>
</tr>
<tr>
<td>Breech</td>
<td>3%</td>
<td>24%</td>
</tr>
<tr>
<td>Transverse</td>
<td>5%</td>
<td>19%</td>
</tr>
</tbody>
</table>
The great frequency in transverse and breech presentations is remarkable, and when we look at the results of treatment of transverse presentation we find a high mortality. Tarnier reported 6 cases in which version was performed of which 5 mothers and 3 children died.

(2) Irregular contractions of the uterus, which are dangerous at all times but especially in the 3rd stage of labour when they are the great cause of post partum haemorrhage. When present in the earlier part of labour they give rise to a prolonged labour. The application of forceps under such circumstances has according to Tarnier even higher mortality than version has. In 6 cases of fibroid pregnancy when forceps were applied he lost 4 mothers and 4 children. Güsserow collected 20 cases in which forceps were applied in fibroid pregnancy, of these 8 mothers and 13 children died. Sänger reports a mortality of 85% in 43 cases, and Pozzi a mortality of 86% in 18 cases where forceps were applied.

(3) Haemorrhage. This may be antepartum, in which case it is due to placenta previa, which, according to Blacker, occurs in one out of every 120 cases, while in normal pregnancy it occurs once in every 500 cases. Post partum haemorrhage is closely associated with fibroid pregnancy and is due to the irregular uterine contractions mentioned above, which hinders the closure of the uterine sinuses. When the placenta is attached
to the fibroid the mucous membrane over the tumour atrophies and the chorionic villi are implanted in the muscular coat. This causes adherent placenta, the detachment of which causes severe post partum haemorrhage.

Gässerow in 147 cases had adherent placenta in 21, which were artificially removed: of these 13 mothers died.

(4) If the tumour is situated in the lower uterine segment it may produce rigidity of the cervix, or, more important still, it may obstruct delivery. Contrary to what one would expect, such a complication is not common as nature overcomes the difficulty in several ways:— The tumour may be drawn up above the pelvic brim in the early stages of labour or before labour comes on; if the tumour is submucous or cervical it is not uncommon to find that the tumour is pushed down in front of the presenting part and extended during delivery. In some instances it is actually born before the foetus. Another way in which the obstruction may be overcome is by the softening which takes place in the tumour during pregnancy. Even if the tumour is still in the pelvic cavity it may become so soft, oedematous and flattened out against the pelvis that it no longer offers any obstruction to the passage of the child.

When this accommodation between the tumour, the foetus and the pelvic wall does not take place the result is disastrous, being either uterine inertia or rupture of the uterus. Sir Talliday Groom, Gässerow, and others,
have reported cases of uterine rupture under these circumstances.

(5) Another complication which may occur during labour, but which is not common, is the tearing of adhesions between the tumour and the omentum or intestines giving rise to fatal internal haemorrhage.

Complications during puerperium.

It is during the puerperium that the gravest dangers of the association of fibroids with pregnancy arise. The most uncommon and most serious complication is sepsis which results from infection of retained products that failed to be expelled at, or soon after, labour, because the regular concentric shrinking of the placental site is interfered with by the tumour.

Another source of sepsis is infection of the tumour itself either directly during labour or secondary to an attack of pelvic cellulitis. In all septic puerperal cases where the symptoms do not improve with simple intra-uterine irrigation it is well to explore the uterine cavity with the finger, for, as has been pointed out by Faultain, a submucous tumour may have become infected during labour and cause the continuance of symptoms. There is a great tendency for submucous tumours to slough and decompose during puerperium. This is brought about in most cases by septic infection. In some the uterine contractions causing anaemia of the tumour may lead to a similar result, while in others the prolonged pressure of
Labour may have lowered the vitality of the tumour to such an extent that it undergoes necrotic changes.

Haemorrhage during the puerperium may be excessive being caused by the interference of the fibroid with the involution of the uterus, or it may come from a fibroid polypus in which case the haemorrhage may be most alarming.

Diagnosis. This may be very easy or very difficult it is easy to overlook the fact that a woman with a large tumour is two or three months pregnant, though we may suspect it on account of the rapid increase in size of the growth with the accompanying pain and pressure. A safe clinical rule is that in every case of rapid growth in the size of a fibroid in a patient who might be pregnant the possibility of such a condition should be suspected. This growth is in some cases only apparent, and may be due to the elevation of the tumour by the pregnant uterus. It is not an infrequent event for a fibroid complication pregnancy to escape recognition. Cases have been related in which a submucous fibroid has been diagnosed as a second of twins.

Subperitoneal fibroids may be overlooked altogether during the last few months of pregnancy because during that period the fibroid undergoes such marked softening that the foetal parts may be felt through the substance of the tumour. On the other hand cases have been diagnosed as fibroids when nothing more than a pregnant uterus
was present. Quite a large number of records may be gathered from the literature of the last ten years where such experiences gynaecologists as Keith, Angus Macdonald, Duncan, Yerman, Kelly, Cullen, and others have performed laparotomy for the purpose of removing a suspected fibroid and have found a foetus instead, and in some cases this was discovered only on subsequent examination of the parts removed.

In palpating the uterus the fallacy of mistaking irregularities of the tumour for foetal parts should be avoided.

Often no certain signs of pregnancy are obtainable till in the later months of pregnancy, when, owing to this softening of the tumour, the foetal parts and movements can be detected.

If between the 4th and 6th month of pregnancy two abdominal tumours can be made out, the gravid uterus contrasts in a very striking manner by its greater softness with the complicating myoma.

The diagnosis is rendered difficult if the haemorrhage caused by the tumour persist during pregnancy.

When the tumour is situated posteriorly the diagnosis is also more difficult than when situated anteriorly, because in the latter position the foetal parts are palpated with greater ease, and the heart sounds are rendered audible.
Points to which special attention should be paid in diagnosing this condition are:

1. The rapid enlargement of the fibroid which for some time has been stationary.
2. Amenorrhoea which is usually but by no means always present.
3. The softness of the passage which may also take place in extra-uterine gestation and in normal pregnancy.
4. Umbilical scuffle, and foetal heart sounds.

The conditions for which fibroid pregnancies have been most commonly mistaken are - ovarian tumours or cysts, pyosalpinx, ectopic gestation, and renal tumours.
**PROGNOSIS.**

The prognosis varies not only with the position and size of the tumour, but also with the stage of pregnancy.

In the early months of pregnancy when the tumour is not giving rise to any symptoms there is no immediate danger.

When symptoms arise that call for operative interference the prognosis to both mother and offspring is more serious in the case of serosal and interstitial tumours than in sub-peritoneal.

During the later months of pregnancy abortion with its attendant risks is a more frequent occurrence than in the early months.

During labour when the tumour is causing obstruction to natural delivery Cæsarean section yields better results than either forceps or version.

Gässerow gives a maternal mortality of 40% in fibroid pregnancy, and Nauss a mortality of 21%.

The mortality in version is even greater.

Lefour, Gässerow & Nauss give the maternal mortality in version in fibroid pregnancy as 60%, 60% and 77% respectively, while Lefour and Gässerow give an infantile mortality of 77% and 65% respectively.
TREATMENT.

A large number of fibroids pass through the course of pregnancy, labour, and puerperium, in an entirely normal way, and are discovered for the first time after the uterus is emptied. On considering Pinard's series we find that of 84 cases, 54 went through pregnancy and labour normally. Winter treated 14 cases of fibroid pregnancy by expectant methods, of which P passed to normal labour, while Cullingworth reported 4 cases of fibroid pregnancy which went through labour naturally.

Some observers have also recorded cases where tumours which from their site and size were considered to cause obstruction to natural delivery have given rise to no untoward symptoms. It is therefore advisable to adopt expectant methods in the first instance.

Symptoms may however arise which jeopardise the life of both mother and foetus, and which render surgical interference not only justifiable but imperative.

The most common symptoms which make surgical interference during pregnancy essential are the following:

1. Great and continuous pain.
2. Rapid growth of the tumour.
3. Threatened abortion.
4. Pressure on and interference with the functions of neighbouring organs.
5. Conditions resulting from the size and position of the tumour, which would render delivery impossible.

1. This forms the commonest indication for operation, and is brought about in various ways, as pointed out before. If the pain is caused by impaction of the uterus or growth within the pelvis it may frequently be obviated by efforts to displace upwards the tumour while the patient occupies the knee-chest position. Such efforts should be practised with the greatest prudence, as cases have been recorded in which large veins in the walls of such tumours have been ruptured causing fatal haemorrhage.

2. Rapid growth of tumour may form an indication for operation, because it may give rise to such enormous distention that the functions of respiration, circulation and nutrition are interfered with to an extent that demands prompt relief.

Rapid growth may also suggest malignancy or degeneration of the tumour so that a laparotomy may be diagnostic as well as a therapeutic agent.

3. When haemorrhage is combined with intermittent pains in a pregnant uterus, the condition indicates an irritability of the uterus which frequently ends in abortion.

4. The most important organs pressed upon are the bladder, ureters and urethra, and Olshausen considers
interference with the urinary apparatus the most important indication for operation,

5. It may be a very difficult problem to decide whether a tumour is going to interfere with labour, because often a tumour is pushed above the brim or in front of the presenting part just before or during the early part of labour.

Tumours at the fundus do not give rise to obstruction in labour.

Tumours of the lower uterine segment and of the broad ligament if of sufficient size will always give rise to obstruction in labour and should be operated on during pregnancy for there is less danger in removing them during pregnancy that there is by non-interference and letting the woman go to term. As a rule vaginal enucleation undertaken in the early months of pregnancy is the most suitable operation in these cases.

7. Excessive vomiting has been the indication for operation in five of my collected cases, and the results of operation have been most satisfactory.

Between the cases in which expectant measures should be adopted and those in which interference is clearly indicated there is a large class in which there is wide room for difference of opinion. Constant observation
in doubtful cases, repeated examinations, and a thorough familiarity with the physiology and pathology of pregnancy can alone guide one against the error of interfering rashly or prematurely, or the opposite mistake of trusting blindly to natural forces.

Not so many years ago it was generally held that surgical interference with pregnant women was to be avoided under all circumstances, and it is only lately that the safety and generally good results of major operations in pregnant women have been demonstrated.

If it has been decided to interfere surgically with the patient there are several courses open to us depending on the nature of the conditions present. They are:

1. Induction of abortion.
2. Pankysterecotony.
3. Caesarean Section.
4. Myomectomy.

1. The induction of abortion need only be mentioned to be condemned. It is attended by grave risks and should never be resorted to in the presence of fibroids. The dangers are haemorrhage, decomposition of the ovum when its expulsion is delayed, and necrosis of a portion of the myoma projecting into the uterine cavity.

Lefour induced abortion in 6 cases of fibroid pregnancy and lost 1 mother and 5 children.
Phillips induced abortion in 5 cases of which 2 mothers died.

This gives a maternal mortality of $5\%$. 

2. Hysterectomy: This operation will be required when an interstitial or submucous fibroid has undergone septic degeneration, or when a general fibromatous condition of the uterus is present so that there is no possibility of making a properly functioning organ of it.

The danger of overlooking malignant disease is also a consideration. Carcinoma of the body of the uterus and fibroid have some intimate relationship since $5\%$ of all cases of fibroid have accompanying carcinoma of the body or have it develop later in the stump.

Noble states that the frequency of carcinoma of the body of the uterus increases 26 times in the presence of fibroid.

Pichelot reports 5 cases of cancer of the cervix occurring in 15 cases where had done supravaginal hysterectomy.

Lisobor states that it is an unquestioned fact that the cervical stump is apt to degenerate. If these cervical stump are so frequently the seat of degeneration we must question the value of supravaginal hysterectomy. There remain thus the two extremes panhysterectomy and myomectomy.
Thurnin collected 145 cases of hysterectomy in the early months of pregnancy with a mortality of 10.07%.

3. Caesarean Section. In every instance where one can do so one should wait until the child is viable and then perform Caesarean Section and it may be followed by hysterectomy.

The cases suitable for Caesarean Section are those in which the fibroid would cause obstruction in labour, but where there are no urgent symptoms necessitating immediate interference.

4. Myomectomy. As experience and a knowledge of pelvic conditions increase the desirability of more conservative measures is impressed upon the gynaecologist, and the saving rather than the destruction of organs becomes his constant effort and practice.

In 1874 Spiegelberg (5) demonstrated the possibility of enucleating fibroid tumours from the uterine wall with closure of the wound by suture. Martin of Berlin (4) shewed that myomectomy could be accomplished without increasing the dangers of the operation to the patient, while it possessed several advantages over hysterectomy. Péan in 1874 was the first to attempt this operation during pregnancy.

The advantages of myomectomy over hysterectomy are:

1. The life of the child may be saved without adding to the risk of the mother's life.
2. There is no prolapse of the bladder and resulting cystitis as in hysterectomy.

3. The most important anterior supports of the rectum and sigmoid are not disturbed and rectal prolapse is not so likely (Fischman)

4. Vaginal hernia and general visceral prolapse into the empty pelvis as well as secondary atresia of the vagina are prevented (Porter)

5. It renders subsequent menstruation and pregnancy possible and on the healthy functioning of the sexual organs depends a woman's disposition, her likes, dislikes, and frequently her mental equilibrium.

The failures which followed the earlier operations of this nature unjustly prejudiced many against its performance, a bias which still obtains among a certain few.

Whether myomectomy is preferable to hysterectomy can only be decided when the abdomen is opened, and will depend largely on the involvement of the uterus and the size and distribution of the tumour.

Myomectomy is especially suitable in subperitoneal growths and in small and medium sized interstitial growths which do not encroach on the uterine cavity. As a rule opening into the uterine cavity will lead to abortion, though cases have been recorded where a uterus so opened went to term. Several tumours may be
eneucleated without leading to abortion.

Myomectomy is not to be considered in those cases in which the growth occupied the whole or the major portion of the uterus. In general, interstitial fibroids of a size exceeding a child's head, do not offer favourable indications for operation.

The ability to decide when myomectomy should be done is often a difficult matter, but it is safe to say that the more skilful the operator the less frequently will he find it necessary to resort to hysterectomy.

The regeneration of smooth muscular tissue after myomectomy may take place to some extent, but after-healing results largely through the formation of fibrous tissue. Clinically it would appear that either the amount of fibrous tissue is deposited after myomectomy is small, or that some subsequent change takes place whereby it is largely removed, for its presence does not appear to interfere in any way with the function of the organ.

Tuffier in one case opened the abdomen eighteen months after he had removed a myoma weighing 3 lbs by enucleation and found it quite normal.

After the skin has been prepared as for any abdominal operation the procedure in abdominal myomectomy is as follows:

The patient is placed in the Trendelenberg position and the abdomen opened by a sub-umbilical mesial incision.
The uterus is packed off so as to prevent any blood entering the general peritoneal cavity.

If the tumour is pedunculated its pedicle is transfixed, and tied in a Staffordshire knot and cut in such a way that a wedge-shaped cavity is left, over which the peritoneum is stitched. If the tumour is interstitial its capsule is divided by a median longitudinal incision. The tumour is then caught with a volsellum forceps and shelled out with the finger or a blunt dissector.

The bed of the tumour is closed by two rows of sutures, the first including the muscular wall of the uterus only and does not penetrate the mucous coat; the second including the peritoneum only.

If several tumours are present and they are in close proximity they may often be removed through the same incision.

If adhesions are present between the tumour and any of the surrounding organs these are first tied and then cut. The abdominal wall is closed in three layers.

In performing vaginal myomectomy it may be necessary in the case of large tumours to remove them piecemeal.

Vaginal enucleation should not be attempted if the attachment of the tumour extends so far up as not to be within reach of the finger.

The risks of myomectomy are haemorrhage and sepsis. Haemorrhage is only troublesome in large interstitial
tumours, and the increased blood supply of pregnancy favours the risk.

Sepsis is liable to take place when the bed of the tumour has not been brought in perfect apposition. The blood clot which forms in the dead spaces is easily infected.

During pregnancy the operation is more easily performed than in the nonpregnant state, because the hyperplasia of the connective tissue and the laxity of the peritoneum favours the separation of the tumour from the uterine wall.

The maternal mortality in the 109 collected cases given below was 5.2%.

Compared with Thumin's mortality of 10.07% in hysterectomy in pregnancy it gives a percentage of recovery favourable to myomectomy of 4.87%.

Carstens gives a percentage of recovery of 0.8% favourable to myomectomy. The older literature as a rule gives a rather unfavourable mortality as compared with hysterectomy.

The mortality is determined by a proper selection of cases and by perfection of technique.
My own experience of myomectomy during pregnancy is limited to the following case in which I assisted at the operation and had the after-care of the patient:

X.Y.Z., aged 36 years, was admitted to the Hampstead General Hospital under the care of Dr F.M. Taylor on May 12th 1909 complaining of a painful and tender abdominal swelling associated with amenorrhea.

The patient had been married ten years and had never been pregnant. Menstruation had always been quite regular and painless until December 1908, since when there had been complete amenorrhea.

In January 1909 a lump was felt in the abdomen which had been gradually getting larger since. There was some sickness during December and January, but this usually occurred towards evening and not in the mornings.

The breasts, too, at first enlarged, but the patient thinks they had lately somewhat diminished in size. A well-marked areola was present, with Montgomery's follicles, and a little serous fluid could be expressed.

The mass was free from pain until a few days before the patient was seen by Dr Taylor, but for the last few days there had been considerable pain in it.

Inspection shewed the tumour to be generally enlarged, especially below the umbilicus, with definite bulging in the left flank. On palpation two definite swellings could be made out, and slightly to the left of the middle line, reaching halfway up to the umbilicus,
it was softish in consistence, giving the impression of the pregnant uterus, and was free from tenderness.

The other swelling lay to the right of this and bulged the right flank; it was hard and very tender and was freely movable, and appeared to be attached by a pedicle to the uterus. The pain was definitely located to the site of this swelling. A uterine souffle could be plainly heard on auscultation, but foetal heart sounds could not be detected. On vaginal examination the vulva and vagina shewed distinct violet discoulouration.

Bimanually the cervix was softened, and was continuous with the softish tumour above described on the left of the abdomen, which was free from tenderness.

On the right, the lower pole of the hard abdominal tumour could only be felt; it was freely movable and very tender. The pulse and temperature were normal. We came to the conclusion that the softish swelling reaching halfway to the umbilicus was the pregnant uterus a little over four months, and that the hard, movable, tender swelling to the right of the uterus was a pedunculated subserous fibroid undergoing red degeneration, which accounted for the pain and tenderness.

On account of the patient's age, the fact that she was pregnant for the first time after ten years of married life, and that she herself was very anxious to have a living child, Dr Taylor recommended no
interference, but that the patient should go to term and be delivered naturally, seeing that the fibroid was well out of the pelvis, and would not cause any obstruction to the passage of the child.

The pain and tenderness, however, increased in severity to such an extent that the patient demanded that something should be done even if it entailed loss of the child.

She was accordingly admitted to the Hampstead General Hospital on May 12th 1909. The condition was still the same as that described, except that the uterus now reached almost to the level of the umbilicus.

On May 15th the abdomen was opened by a median sub-umbilical incision, and the enlarged uterus soft and bluish presented; attached to the right side of the uterus was a pedunculated fibroid tumour about the size of a foetal head. Omentum and intestines were found attached to the whole convex surface of the tumour by recent soft adhesions. These were readily separated with the finger. The pedicle, which was of the thickness of two fingers was ligatured by transfixion and the tumour was removed.

Two sessile subserous fibroids, the size of a plum and a tangerine orange respectively, were found in the fundus of the uterus. These were enucleated and the spaces were obliterated by catgut sutures. The abdominal wall was sutured in three layers, the skin
skin being united with Michel's clip sutures.

Recovery was uninterrupted, the sutures being removed on the eighth day, when foetal heart sounds were heard and the patient felt foetal movements.

Dr. Torrens, the pathologist, reported on the specimen as follows: - "The tumour is a very necrotic fibro-myoma, suggesting that the blood supply has been interfered with". There had, however, been no torsion of the pedicle, nor was the condition a true degeneration, the tumour being softish, grey in colour, and containing a few small cystic spaces containing clear fluid.

The pregnancy went to term, and the patient was delivered of a healthy girl weighing 9½ lbs after an extremely easy labour, lasting only four and a half hours, the abdominal wound remaining sound and firm.
A LIST OF MYOMECTOMIES COLLECTED FROM THE LITERATURE, arranged in Chronological order.


2. 1879. J. Knowsley Thornton (6) Aged 37. 7 months pregnant. It was impossible to define accurately the position of the uterus as the pelvic cavity was filled with a hard round adherent mass, the softened cervix being felt high up in front and rather to the left side. Diagnosis - Ectopic gestation. Operation - The pregnant uterus was on left and the whitish solid tumour to the right of middle line. Tumour was adherent to parietes, and to coils of intestine and to omentum. The short pedicle was transfixed and tied and tumour removed. Result - Abortion 12 hours after operation. Died on the fifth day from symptoms of intestinal obstruction, the vomiting being constant.

5. 1881. Landau (7) Aged 35. 3 months pregnant. Primigravid. Been regular up to time of admission. Symptoms - Very severe pains in lower part of
abdomen which have increased very markedly during the last few months.
P.V. To the right of the enlarged uterus a movable broad pedicled tumour could be palpated.
Diagnosis - Fibroid?
Operation - A little free fluid in peritoneal cavity. A fibroid size of foetal head attached to the right side of the uterus. A second smaller one size of a hen's egg to the left of uterus. The pedicle of larger one was transfixed and tied and the tumour removed.
Result - Recovery and delivery at term.

4. 1881. Martin (8) - Aged 40. 5 months pregnant.
Primigravid married 9 months.
Symptoms - Pains rapidly increasing in severity during the last three months. Rapidly increasing size of abdomen. Abortion threatened a month previously. Shortness of breath. On examination on upper part of abdomen was a hard mass with several knots on its surface. Uterus was enlarged and soft. Cervix patulous.
Operation - Tumour lay in upper part of abdomen and was freely movable. Enlarged vessels over tumour. Tumours were split and enucleated, not much haemorrhage. The bed of the tumour was closed with buried and superficial sutures. A smaller tumour was removed on the right side with pretty severe haemorrhage.
Result - Abortion on 5th day with severe haemorrhage.

5. 1882. Martin (8) Aged 41. 4 months amenorrhoea.
Primigravid.
Symptoms - Great deal of pain in abdomen and vomiting.
A lump in abdomen is rapidly increasing in size.
Painful micturition.
P.V. Body soft and enlarged to a 4th month pregnancy
with a hard, knotty, growth to right of uterus.
Operation - Some fluid in peritoneal cavity.
Pedicle transfixed and tied. Tumour removed.
Two other tumours were enucleated.
Result - Abortion same night. Recovery.

6. 1882. Langenbeck (8) Patient 4 months pregnant.
A tumour size of a hen's egg in anterior wall of uterus.
Result - Abortion day after operation. Recovery.

four years. During the last month noticed a slightly
movable swelling on the right side which had
distinctly increased in size. Had labourlike pains
which simulated a threatened abortion.
P.V. Cervix soft, body enlarged almost size of a
foetal head. Tumour was hard and nodular and in
right hypogastric region.
Indication for operation - To prevent abortion.
Operation - Tumour was sessile. It was enucleated. Severe arterial bleeding which was stopped by stitching.

Result ?.

9. Routier - 1885 (9). Aged 37. 5 months pregnant.
Symptoms - severe pains in abdomen.
Phys. Excm. - A large pedunculated kidney shaped fibroid reaching from pubis to the diaphragm, attached to the fundus uteri.
Diagnosis proved to be correct at operation.
Result - Recovery. Went to term.

9. 1885. Ogden. (10) An interstitial fibroid of uterus was enucleated. Pregnancy was suspected but not diagnosed before operation.
Result - Abortion 12 days after operation.
Recovery.

10. 1887. Schroeder (11). 5 months pregnant.
Removed with trouble a pedunculated fibroid.
Result - Recovery. Went to term.

11. 1888. Bidder (12) - Aged 51. 4 months pregnant.
Married five years. Tumour had been present 15 years. It filled the whole pelvis and right side of abdomen and reached to the ribs. Uterus was pushed upwards and to the left. Patient has lost weight.
Diagnosis - Pregnancy and a pedunculated fibroid.
77. Operation - Adhesions to omentum and in Pouch of Douglas. Pedicle (four fingers thickness) was transfixes, tied and slipped back.

Result - Death on 7th day from peritonitis and nephritis. Fatty degeneration of liver and heart. A piece of iodoform gauze was found in the Pouch of Douglas.

12. 1888. Leopold (13) - Aged 34, 6 months pregnant. Has had four children.

Symptoms - Pain on the left side of pelvis and around the bladder from the beginning of pregnancy.

Operation - A calcified myoma of anterior uterine wall, the size of a fist and extending deeply into the muscular coat.

The haemorrhage was profuse and was checked by drawing the surfaces together with deep and superficial sutures.

Result - Recovery. Went to term.

13. 1889. C.A.Bergh (14) - Aged 41, 4 months pregnant.

Primigravid. A tumour twice the size of a fist firm and attached to the uterus on right side. A similar one but smaller on the left side.

Indications for operation - The patient was much distressed by the tumour, could neither stand or lie down, and was anxious to get rid of it.

Operation - Tumour was enucleated and the cavity closed in layers.
Result - Recovery. Normal labour at term.

14. 1889. Brennecke (15) - 5 months pregnant.
A solid tumour, situated high up with numerous adhesions to omentum and to small intestines. The tumour was a subserous myoma with a short thick pedicle which was tied and the tumour removed.
Result - Recovery. Delivery at term.

15. 1889. Gordon (16) - 5 months pregnant.
A broad based fibroid was removed, and the peritoneum united over the cavity.
Result - Recovery. Very painful labour at term.

16. 1890. Von Braun (17) - 4 months pregnant.
Tumour was attached to uterus by a thick pedicle and weighed 4,800 grms.
Pedicle was tied and tumour removed.
The ligature slipped and another was applied.
Result - Recovery. Delivery at term.

17. 1890. Calderini (17) Related a case at the 10th international congress of Gynaecologists at Berlin.
A myoma of the cervix was enucleated and the pregnancy continued undisturbed.

18. 1890. Braun-Fernwald (18) - Aged 35. 4 months pregnant. Nullipara.
Diagnosis - A large Fibromyoma.
Operation - A broad-pedicled fibroma, growing from fundus and weighing 4800 grms was removed by tying the pedicle. The ligature slipped and had to be re-applied.

Result - Recovery. Delivery at term.

19. 1892. Flaischler (19) - Aged 32. 3 months pregnant. Primigravid.

Symptoms - Headache and great pains in the back. Rapidly growing tumour.

On examination - Behind and to the left of the uterus could be felt a firm nodular pedunculated tumour the size of a child's head.

Diagnosis - Malignant ovarian and pregnancy.

Operation - Two fibromyomata present. The larger on the left side, pedunculated and situated posteriorly. The other situated anteriorly was sessile and the size of an apple. The pedicle of former was tied and the tumour was removed. The latter was enucleated and bed closed with buried catgut sutures.

Result - Recovery. Delivery at term.

20. 1892. Macgenrodt (20) - Aged 35. 3 months pregnant.

Became pregnant after a long period of sterility.

Symptoms - Almost uninterrupted pain in back. Fairly severe haemorrhage in second month of pregnancy. Vain attempts to stop the haemorrhage
by rest.

P.V. Body of uterus retroflexed and fixed in this position by a tumour the size of a fist, attached to the left corner of the uterus.


Result - Recovery - Haemorrhage and pains in back ceased. No abortion 7 weeks after operation.

21. 1892. Frommell (21) Aged 36. 4 months pregnant. Had a child seven years ago. Patient had noticed a slowly growing tumour in abdomen for several years. Abdomen increased in size abnormally during last four months.

On examination - On the left side was felt a fairly soft tumour like a pregnant uterus, while on the right a more resistent tumour fixed to the uterus was present. The uterus was pushed up so that the cervix lies on the left and high up at brim of pelvis.

Diagnosis - Cystic ovarian tumour.

Indication for operation - Fear of obstruction in labour.

Operation - A myoma in the layers of the right broad ligament was enucleated with difficulty. It had pushed the bladder out of the pelvis. There was fairly severe haemorrhage from the bed of the tumour which was arrested first by manual compression then
by several layers of stitches.

Result - Recovery. Delivery at term.

22. 1892. Kelly & Cullen (22) Aged 25. Had had no children and no miscarriages.

Operation - myomectomy.

A supraperitoneal myoma 7 x 6 x 8 c.m. projecting from posterior wall of uterus removed.

Result - Recovery. Delivery at term.

23. 1892. Kelly & Cullen (23) Aged 55. Menses had been irregular, occurring at intervals of from four to nine weeks. Patient noticed a tumour in the left ovarian region six weeks before admission.

It was not tender but increased in size rapidly. A submucous myoma and early pregnancy present.

Operation - Vaginal myomectomy.

Result - Recovery. Delivery at term.

24. 1892. Sir Halliday Croom (24) - Aged 55. 2½ months pregnant. Married five years. Was sterile.

Sought advice because of pain in left side and irregular haemorrhages. Had not missed a period. For a year menstruation had increased in quantity and frequency. Had observed swelling and pain for over three months.

P.V. A semi-solid swelling, size of a cocoa-nut and irregular on the surface was projecting over the brim of the pelvis. The uterus was behind and
enlarged. The cervix was thick soft and patulous.

Diagnosis - Pregnancy and a rapidly growing tumour.

Operation - A soft pedunculated myoma was exposed and removed after tying the pedicle with a double knot.

Result - Recovery. The haemorrhages ceased and patient was delivered at the 7th month.


Menstruation which had been profuse and irregular had been suppressed for two months.

P.V. A soft and tender tumour, palpable over the brim of the pelvis. The uterus was enlarged and on the right.

Diagnosis - Pregnancy and a small ovarian with local peritonitis.

Operation - A large rapidly growing soft pedunculated fibroid was removed.

Result - Death the result of aortic disease.

26. 1892. Sir Yalliday Croom (24) - 5 months pregnant.

Diagnosis - Pregnancy and an ovarian tumour.

Operation - Removal of the ovarian tumour and also of a pedunculated fibroid behind the uterus about the size of a cocoa-nut, very soft and vascular.

Result - Recovery. Delivery at term.
27. 1895. Frommel (25) - Aged 50. 5 months pregnant.
   Symptoms - During last three months had incessant pains in abdomen, so severe that she could not leave her bed. Had several attacks of fever.
   Palpation of abdomen is painless except at one place on the right side the size of palm of hand which is intensely tender, and she states all pain originated from this spot.
   P.V. A tumour size of hen's egg attached to the right side of the uterus by a short pedicle.
   Diagnosis - An enlarged ovary.
   Operation - The abnexe are normal and lying behind the uterus on account of slight torsion of the latter. The pedicle was ligatured and tumour removed.
   Result - Recovery. Pain and tenderness disappeared 21 days after operation. No abortion.

28. 1895. Martin (26) - 2 months pregnant. Primipara.
   Patient phthisical. Tumour was the size of a human head and partly cystic.
   Result - Abortion the day after operation.

29. 1895. Guinard (27) - Aged 35. 3 months pregnant.
   Symptoms - Severe uterine haemorrhage since her last period and some leucorrhoea. Severe pains in abdomen.
   P.V. An intraligamentous tumour size of foetal
head to right of uterus.

Indication for operation - Normal labour would have been an impossibility.

Diagnosis - Correct.

Operation - Tumour was removed through a suprapubic incision.

Result - Recovery. Delivered at 7½ months.

30. 1894. Mackenrodt (28) - Three months pregnant.

Symptoms, Fever, pains in abdomen, increasing cachexia.

Operation - Tumour was beginning to degenerate.

The outer side of the decidua was exposed in front.

Result - Recovery. Delivery at term.

31. 1894. Kleinhaus (29) - Aged 52. 4½ months pregnant.

Symptoms - Haemorrhage and a sudden illness with shivering and severe pains in abdomen. These attacks were repeated and were diagnosed as torsion of the pedicle of a large myoma, adherent to coils of intestines and a pregnant uterus.

Operation - An oedematous tumour with superficial necrosis removed. Pedicle was twisted twice on its own axis.

Result - Recovery. Delivery at term.

32. 1896. Kleinhaus (29) - 5 months pregnant.

P.V. Retroflexion of gravid uterus.

Operation - Broad pedicled tumour removed.

Result - Recovery. Delivered at term.
33. 1896. Kleinhaus (29) Aged 44. 11 weeks pregnant, 3 para.
Symptoms - Rapid increase in size of tumour during the last 7 weeks, with severe pains shooting down the leg.
P.V. Ovum could be felt through cervical canal.
Operation - Enucleation of two sessile subserous myomata one on anterior and the other on posterior wall. Removal of the ovaries.
Result - Abortion next day attended by very little haemorrhage.

34. 1896. Bland-Sutton (1) - Aged 23. 1 month pregnant.
Diagnosis - Left sided pyosalpinx.
Operation - Hard ovoid myoma 15 x 5 c.m., springing from the side of the uterus and separating the layers of the broad ligament.
Result - Recovery. Delivered of a healthy child, well-developed, 8 months after operation.

35. 1897. Biermer (50) - Aged 40. Pregnant 4½ months, 8 pregnancies, married 21 years.
Symptoms - Severe pains on passing water, so severe that the nurse had to pass a catheter several times a day. Constipation.
P.V. Uterus is retroposed and a tumour the size of fist behind the symphisis is fixed to the uterus.
Operation - Uterus was pressing on intestines.
Tumour was enucleated and its bed closed with layers
of catgut, the haemorrhage not being severe.

Result - Uninterrupted recovery. Could pass water 5 days after operation, and all bladder symptoms had disappeared. Spontaneous delivery of a putrefied child 6 weeks after operation.

36. 1897. Selhorst (51) - Aged 56. 4½ months pregnant.

Primipara. Married 2½ years.

Patient had tumour in abdomen before marriage.

Menstruation had always been regular.

P.V. A movable tumour size of child's head on the left side of abdomen. Cervix soft. A soft tumour could be felt in Pouch of Douglas.

Diagnosis - Subserous fibroma and retroflexion of gravid uterus.

Operation - Enucleation of sessile tumour size of child's head. Reposition of the retroflexion.

Result - Recovery. Delivered at term.

37. 1897. Olshausen (52) - Aged 59. 5 months pregnant.

Married 12 years. Sterile till then.

Two pedunculated myomata were removed 960 and 650 grms, respectively.

Result - Normal labour at term. Placenta was removed manually.

38. 1897. Carstens (55) - Aged 27. 5 months pregnant.

Patient was very anxious to have a child having been married seven years, but did not think she was all right.
Diagnosis - Pregnancy and a number of fibroid.

Indication for operation - One of fibroids situated between the uterus and bladder would interfere with delivery.

Operation - The uterus was studded with fibroids. The above-mentioned fibroid was removed along with two others in the anterior wall.

Result - Recovery. Premature birth at the 7th month.


Operation - To the right of the uterus was a dense hard myoma, firmly attached to the uterus. This was removed and was 10 c.m. in diameter. Another large myoma was situated low down in the broad ligament to the left of the cervix and was not removed.

Result - Abortion 10 days after operation.

40. 1897. Kelly & Cullen (54) - Aged 25. 3½ months pregnant. Married seven months.

Operation - An interstitial myoma 8 x 9 x 12 c.m. was removed. The haemorrhage was excessive.

Two other small myomata were also removed.

Result - Abortion 24 hours after operation.
41. 1897. Morris (55) - Aged 54. 4½ months pregnant.
Married 3 years. Primigravid.
Symptoms - Urgent vomiting which was almost continuous and severe abdominal pain.
On examination - The growth occupied the left side of the abdominal cavity from the margin of the ribs down to the pelvis.
Diagnosis - Retroperitoneal tumour. Fibrolipoma in neighbourhood of kidney. The diagnosis was difficult from the fact that the myoma had fallen backwards and had small intestines covering part of its anterior surface.
Operation - Removal of a cystic subperitoneal pedunculated fibroma weighing 4 lbs.
Result - Recovery. Delivered at term.

42. 1897. Jacobs (56) - 5 months pregnant.
Symptoms - Great pain in abdomen.
Operation - Removal of a pedunculated fibroid attached to posterior wall of uterus, and which was incarcerated in the pelvis.

43. 1897 - Thompson (59) - 2 months pregnant.
Operation - Removal of a subperitoneal fibroid the size of a foetal head.
44. 1898. Downes (58) - 5 months pregnant.
Operation - Removal of an ovarian cyst together with the enucleation of several subserous and an intraligamentary myoma.

45. 1898. Wallace (59) - Aged 58. 2 months pregnant.
Married two years. A tumour was known to exist in abdomen for 20 months.
Symptoms - Nausea and vomiting, most marked in the morning. Was pregnant once before and miscarried with very severe haemorrhage.
P.V. The pregnant uterus was felt retroverted below and behind the tumour which was the size of a foetal head.
Indication for operation - The uterus was wedged in pelvis and could not increase in size.
Diagnosis - Pregnancy and a tumour.
Operation - The tumour was hard and undergoing calcareous degeneration. Numerous adhesions connecting the tumour to the pelvic brim; the vermiform appendix and omentum were freed and the tumour lifted out of abdomen. Two pedunculated myomata of the anterior wall were removed.
Result - Recovery. Delivered at term. Morning sickness stopped after operation.

46. 1898. Carstens (55) - Aged 25. 4 months pregnant.
Operation - A hard fibroid 5"x 2" was enucleated
without trouble.
Result - Recovery. Lost touch with case.

47. 1898. Van Tasselt (40) - 5 months pregnant.
Operation - Enucleation of a myoma the size of a fist.
Result - Recovery. Delivery at term.

48. 1899. Coe (41) - 5 months pregnant.
Operation - Removal of a pedunculated fibroid which exhibited early necrotic changes.
Result - Recovery. Delivery at term.

Aged 29. 5 months pregnant. Married 21 months.
Second pregnancy. Menstruation has always been regular.
Growth been growing slowly for two years.
P.V. A large hard tumour reaching to ribs attached to the uterus by a narrow pedicle.
Operation - Numerous adhesions between omentum and tumour.
The pedicle which was 4” thick was tied and tumour removed.
Result - Recovery. Abortion 5 days after operation.

Aged 26. 4 months pregnant.
Symptoms - Pain in the left groin which was gradually becoming more severe. Obstinate constipation.
P.V. A hard movable lump the size of an orange in
iliac region.

Diagnosis - Tense ovarian cyst or solid ovarian tumour.

Indication for operation - The tumour from its position at the brim of pelvis was likely to interfere with labour.

Operation - The tumour was attached to left side of the uterus low down. The appendages were normal. The well-defined pedicle was transfixed and the tumour removed.

Result - Recovery. Delivery at term.

51. 1899. Buckley (42) - Aged 28. 5½ months pregnant.

Symptoms - Severe pain.

The tumour size of cocoa-nut was attached to left side of fundus. It was hard and freely movable.

Operation - A pedunculated fibroma adherent to the omentum and some local peritonitis. The pedicle was ligatured and tumour removed.

Result - Recovery. Delivery at term.

52. 1899. O'Shea (43) - Two subperitoneal fibromyomata one the size of an orange the other the size of a walnut.

Result - Recovery. Delivery at term.

53. 1899. Carstens (33). - Aged 34. 5 months pregnant.

Two fibroids present, the one in the broad ligament 2" x 1½", the other posteriorly in the Pouch of Douglas.
Indication for operation - The posterior tumour would have caused obstruction in labour.

Operation - Enucleation of tumours.

Result - Abortion on 3rd day after operation. Profuse haemorrhage at abortion. Death on 4th day.

54. 1899. Farges (44) - 5½ months pregnant.

Operation - Removal of a putrefied subperitoneal fibromyoma weighing 2 kilogs.

Result - Recovery. Delivery at term.


7 months pregnant.

Operation - Enucleation of a fluctuating myoma the size of an orange.

Result - Recovery. Forceps delivery at term.

56. 1900. Cullingworth (45) - Aged 52. 7 weeks pregnant. Primipara. Pain in the situation of a pedunculated subperitoneal fibroid the size of a fist and attached loosely to the fundus in front and to the right.

Operation - Myomectomy. Tumour 4½" x 3". was connected to the uterus by peritoneum only.

Result - Recovery. Delivery at term.

57. 1900. Cullingworth (45) - Aged 55. 4½ months pregnant. Primipara.
P.V. A large solid tumour behind and to the right of the pregnant uterus.

Diagnosis - A retroperitoneal tumour - either a lipoma or renal tumour - and not connected with the uterus.

Operation - Myomectomy. The tumour was a large pedunculated fibroid weighing 4 lbs.

Result - Recovery. Delivered at term.

58. 1900. Bland-Sutton (46) - 4 months pregnant.

Symptoms - Pain in the left iliac fossa.
Diagnosed as a pyosalpinx. Ovarian cyst and a sessile fibroid by different gynaecologists.

Operation - Removal of a sessile fibromyoma.

Result - Recovery. Delivered at term.

59. 1900. Wyder (47) - Operation - Enucleation of a myoma the size of a foetal head from the anterior surface of a gravid uterus. The uterine cavity was opened during enucleation.

Result - Recovery. Delivery at term.

60. 1900. Thorn (4) - 3 months pregnant.

Operation - Enucleation of a subserous intraligamentous myoma. The tumour had caused torsion of the uterus through an angle of 180°.


Diagnosis - A myoma of cervix the size of a fist.
Operation - Vaginal myomectomy. The bed of tumour closed with layers of silk.

Result - No abortion 5 weeks after operation.

63. 1901. Verhoeve (49) - Aged 37. Primigravid. 6 months pregnant.

Symptoms - Bad appetite, constant vomiting, marked dyspnoea, precordial pain, oedema of the lower extremities, rapid increase in size of tumour.

On examination - Firm tumour reaching to xyphoid cartilage. Foetal heart-sounds heard in two places.

Operation - A very large tumour with numerous adhesions to the omentum and colon. Profuse bleeding during enucleation of the tumour.

Result - All the symptoms disappeared after the operation.

Abortion of twins 24 hours after operation.

65. 1901. Kelly & Cullen (22) - Aged 25. 4 months pregnant. Married 6 months. Multiple myomectomy. A large pedunculated myoma 8 x 8 x 12 cm. Sprunging from anterior wall of fundus with a smaller one beside this and a third on the posterior wall. The pedicle of the large tumour was ligatured and the tumour removed, the others were enucleated.

Result - Recovery. Delivery at term.

64. 1901. J. Bland-Sutton (50) - Aged 52. 4 months pregnant. Married four years. Miscarried twice.
Symptoms - Great pain in the pelvis. The tumour was noticed as the uterus rose in the abdomen.

Diagnosis - Undetermined.

Operation - Oblique incision was made to right of middle line. A subserous myoma the size of a tennis ball and adherent to the bladder.

Result - Recovery. No abortion two months after operation.

65. 1901. Thring (51) - Aged 29. 6 months pregnant. Married one year.

Symptoms - Pain and inconvenience.

P.V. A pedunculated myoma attached to right side of anterior surface of the fundus.

Operation - Removal of tumour by two curved incisions making two short flaps. The vessels were ligatured and the flaps joined.

Result - Recovery. Delivered at term.

66. 1901. Kelly & Cullen (22) - Aged 54. 4 months pregnant. Symptoms - Uterine haemorrhage.

P.V. A cystic mass was projecting above pelvic brim. Pregnancy was not diagnosed.

Operation - A myomatous tumour occupied the anterior lip of cervix and encroached on the anterior vaginal wall. The myoma was shelled out and the area of vaginal mucosa removed with it.

Result - Recovery. Delivered at term. In this case
the myoma so obstructed the pelvis that normal labour would have been impossible.

67. 1901. Schälein (52) - 5 months pregnant.
Operation - Removal of a cystic fibroid the size of an adult's head.
Result - Recovery. Twins delivered spontaneously at term.

68. 1901. Landau (55) - 2½ months pregnant.
Operation - Enucleation of a tumour the size of a fist.
Result - Normal delivery at term.

69. 1901. Landau (55) - 5½ months pregnant.
Operation - Enucleation of two fibromyomata, one the size of a fist, the other the size of a walnut.
Result - Normal delivery at term.

70. 1902. Marschner (54) - Aged 30. 3 months pregnant.
Second pregnancy.
Symptoms - Loss of appetite, nausea, vomiting, increasing pains in the back and abdomen.
Diagnosis, - Ectopic gestation.
The uterus was pushed up. Left ovary swollen.
The tumour was mainly in the right half of pelvis and was immovable even under an anaesthetic.
Operation - Fundus was fixed by numerous adhesions to Pouch of Douglas. These were tied and cut through.
A sessile fibroid was removed from posterior wall of cervix.


71. 1902. Montgomery (55) - Aged 27. 4½ months pregnant.

Symptoms - Almost continuous pain. The abdomen was much larger than it should be for a 4½ months pregnancy.

Operation - A myoma 5" diameter in the posterior wall, and a second of 2" diameter in the anterior wall, were removed. These tumours had caused rotation of the uterus which accounted for the pain.

Result - Delivered of a child 13 lbs after a somewhat prolonged labour.

72. 1902. Montgomery (55) - Aged 55. 3 months pregnant. Patient was suffering from Graves's disease. , a mitral murmur, and a pulse of 140.

Operation - under spinal anaesthesia.

The myoma occupied the greater part of the posterior uterine wall, and was in the pelvis. The pregnant uterus was about it and was dragging up the bladder. Enucleation of the tumour which was necrotic.

Result - Recovery. Normal labour at term.
73. 1902. J. Bland-Sutton (56) - Aged 56. 6 weeks pregnant. 
Diagnosis - A large uterine fibroid growing from anterior 
aspect of the uterus, compressing the bladder and producing pain. 
Operation - Myomectomy. 
The tumour showed red degeneration. 
Result - Recovery. Delivered at term.

74. 1905. Carstens (55) - Married one year. 5 months pregnant. 
Diagnosis - Pregnancy and a hard tumour, either a 
pedunculated fibroid ovarian or dermoid. Tumour was growing rapidly. 
Operation - A wedge-shaped incision was made into 
the pedicle of a pedunculated fibroid and the tumour removed. 
Result - Recovery. Delivered at term.

75. 1905. Carstens (57) - Aged 42. 4 months pregnant. 5-para. 
Symptoms - Has been menstruating profusely for some years. 
Diagnosis - Several fibroids, one of which is situated between the uterus and the bladder, and would interfere with labour. 
Operation - Removal of three fibroids. One was near the internal os 1"x1 ½" in size. Another near the right horn was deeply interstitial. 
Result - Recovery. Abortion on 8th day.
76. 1905. Johnson (58) - 4 months pregnant.

Operation - Myomectomy.

Result - Recovery. Delivered at term.

77. 1905. Thring (51) Aged 29. 5½ months pregnant.

Abortion 2½ years after last confinement.

Symptoms - Frequency of micturition. Pain and rapid increase in size of abdomen.

Operation - A fibromyoma wedged in pelvis and attached to the lower uterine segment was pushing the uterus upwards, forwards, and to the right. The tumour was enucleated and its bed closed with buried catgut sutures.

Result - Recovery. Delivered at term.

78. 1905. J. Bland-Sutton (56) - Aged 54. 6 months pregnant.

Symptoms - Sudden acute abdominal pain.

Temperature 100°

P.V. A rounded smooth and exquisitely tender tumour in the right iliac fossa closely attached to the uterus.

Diagnosis - Ovarian tumour and a twisted pedicle.

Operation - Removal of a sessile fibromyoma which had undergone red degeneration.

Result - Recovery. Delivered at term.
79. 1904. Kelly & Cullen (22) - Aged 33. 4 months pregnant. Married 11 years, never been pregnant.
Operation - Myomectomy. A tumour 7 c.m. in diameter was removed. Several others were present. Great difficulty in controlling the bleeding.
Result - Abortion on the 5th day with manual removal of the placenta. On 6th day enterostomy to relieve the distension of the intestines. Death on 7th day.

80. 1904. Alban Doran (59) - Aged 28. 2 months pregnant.
P.V. A bilo bed swelling of the uterus which almost reached to the umbilicus, the left side much harder than the right. The cervix was pushed to the right by a firm mass which occupied the whole of the left half of the pelvis.
Operation - A sessile subserous fibroid, irregular on surface and large veins in its capsule lying to the left of the uterus. It was held down by dense adhesion to the back of the left broad ligament which was clamped and separated. The tumour was enucleated by a circular incision round its base and weighed 21bs 2 oz. Very little haemorrhage.
Result - Recovery. Delivered at term of a healthy child after a rather tedious labour due to excess of liquor amnii.

81. 1904. Thring (51) - Aged 24. 3½ months pregnant.
Married 5 months. No previous pregnancy.
Operation - The incision was made through the inner margin of the right rectus sheath. A large fibroid lying between the layers of the right broad ligament was shelled out. The uterus had been pushed upwards and to the left. The tumour was attached to the right posterior part of cervix.

Result - Recovery. Delivery at term.

82. 1904. Thring (51) Aged 40. 6½ months pregnant.
No previous pregnancies.
Symptoms - Pain, discomfort, tenderness on pressure.
Temperature varying from 98.4 to 101°.
Operation - A tumour was enucleated through an incision into the fundus and anterior surface of the uterus. The adnexa were normal. The tumour was undergoing cystic degeneration and necrotic changes.
Result - Recovery. Abortion 36 hours after operation.

85. 1904. Thring (51) - Aged 54. Married. 5-para.
Operation - A fibroma was filling the pelvis and had pushed the uterus upwards and forwards.
The tumour was enucleated, free bleeding from the venous sinuses being present. The bleeding was controlled by ligatures and layers of sutures.
The adnexa were normal. A gauze drain was inserted from the Pouch of Douglas into the vagina.
Result - Recovery - Delivered at term.
84. 1904. Thring (51) - Aged 38. 6½ months pregnant. Nullipara.
Symptoms - Pain, tenderness and discomfort in the epigastric region.
Temperature varying between 98.6 & 101. P.V. A tender tumour felt above the umbilicus connected with the uterus.
Operation - Incision made over the tumour through the right rectus sheath. The tumour was interstitial and was enucleated through a deep incision, which was closed in three layers.
Result - Recovery. Delivered at term.
Report of the tumour - There were four distinct areas of necrotic change in the tumour.

85. 1905. Webster (60) - Aged 51. Married 10 years.
Symptoms - Uterine haemorrhage for 12 days previous to admission.
P.V. A firm swelling behind the symphysis, extending to the right, and more or less fixed.
Diagnosis - Fibroids and pregnancy.
Operation - Removal of a large tumour developing from the cervix and extending extraperitoneally in close relationship to the right broad ligament. The entire uterine contents were also removed through the myomectomy wound. The uterine cavity was drained through the cervix with a strip of gauze.
Recovery.
Always had profuse and irregular menstruation.
P.V. Several hard uterine tumours. Pregnancy was not suspected.
Operation - Removal of six fibroid tumours, two of which were deeply situated.
Result - Recovery. Abortion 7th day.

87. 1906. Hewetson (61) - Aged 55. Had an abdominal tumour for four months. There were no subjective symptoms beyond enlargement of the abdomen.
Two months amenorrhoea. The breasts were slightly full, the areola pigmented and clear secretion could be expressed from both nipples.
P.V. The body of the uterus was soft and rounded, and above it was a firm freely movable tumour.
Diagnosis - Pregnancy and a solid tumour loosely attached to the uterus.
Indications for operation - Size of tumour and fears of complications in the tumour.
Operation - The removal of a large pedunculated fibroid which was adherent to the omentum and small intestine. Also removal of an interstitial fibroid, the size of a tangerine orange, in the anterior uterine wall. The haemorrhage was small in amount. A third fibroid was removed from the right broad ligament with rather free haemorrhage. The large
tumour weighed 704 grms and shewed areas of fatty and cystic degeneration, with extravasation of blood in the centre.


88. 1906. Thring. (62) – Aged 32. 5 months pregnant.

Married 5½ months.

Symptoms – Pain and discomfort in the abdomen, especially in the left iliac region, where the patient had noticed a lump which was growing rapidly. Vomiting of pregnancy was troublesome.

P.V. A large, irregular, tender mass in the region of the left corner of the uterus.

Operation – Removal of a nodular fibromyoma, with whitish patches on its surface and growing from the left cornu of the uterus. Some small hard whitish nodules were scattered over the fundus.

The wound was closed in three layers.

Myxomatous degeneration in a part of the tumour.

Result – Recovery. No abortion one week after operation.

89. 1906. Alban Doran (65) – Aged 35. 4 months pregnant. First pregnancy. Diagnosis – Uncertain.

Operation – Removal of a sessile subserous fibroid from the left horn of the uterus.

Result – Recovery. Delivered at term after a labour which was prolonged on account of conditions not associated with the operation.
90. 1906. Lewens (65) - 5 months pregnant.
   Diagnosis - Uncertain. ? Ovarian dermoid.
   Operation - Removal of a subperitoneal fibroid the size of a tangerine orange.
   Result - Recovery. Normal delivery at term.

91. 1906. Menge (64) - Removed a tumour from the gravid uterus.
   Result - Recovery. Normal delivery at term.

92. 1906. Montgomery (55) - 2 months pregnant.
   Operation - Removal with considerable difficulty of a tumour situated in the pelvis which had developed in the posterior uterine wall.
   Result - Recovery. Delivered at term.

   5 months pregnant.
   Operation - Removal per vagina of a subserous myoma.
   The ligature slipped and laparotomy was performed to stop the bleeding.
   Result - Recovery. Delivery at term.

94. Manclaire (66) Enucleated a fibroid situated in the anterior wall of a gravid uterus which was incarcerated in the true pelvis.
   Result - Recovery. Delivered at term.

Aged 50. 5 months pregnant.
Symptoms - Rapidly growing tumour in abdomen, which was the cause of her seeking medical advice.
P.V. A tumour size of fist on right side of the uterus, was suspected of malignancy.
Operation - Enucleation of three subperitoneal myomata.
Result - Recovery. Delivery at term.

1907. Laubenbarg (68) - 10 weeks pregnant.
Symptoms - Severe abdominal pains.
Retention of Urine.
P.V. Uterus retroflexed in the Pouch of Douglas. In the anterior wall of uterus was a sessile myoma the size of a fist, and three smaller ones.
Operation - Enucleation of all the tumours, great care being taken to avoid unnecessary handling of the uterus. On enucleating the large tumour the ovum was covered only by a thin layer of tissue. After the operation the uterus was almost anteverted.
Result - Recovery. Delivered at term.

1908. Gillette (69) - Patient aged 55 is the subject of hip Joint disease. 5 months pregnant.
P.V. An interstitial fibroid the size of a small orange in the anterior uterine wall, so
so that it gives much concern as to its effect on
the progress of pregnancy and on delivery.
Symptoms - Frequent and uncontrollable vomiting
causing much distress.
Operation - Myomectomy. Catgut sutures were used
to stop the haemorrhage from the bed, which was not
profuse.
Result - Recovery. The vomiting almost immediately
came to an end, though the slight nausea continued
for a time.

98. 1908. McMurtry (70) - Aged 32. 4 months pregnant.
Primigravid.
Symptoms - Abdominal tumour was growing rapidly.
Operation - Enucleation of two subserous fibroids
from the lower uterine segment.
Result - Recovery. No abortion six weeks after
operation.

99. 1908. Sadowsky (71) - 5 months pregnant.
Operation - Removal of a large intraligamentous
myoma of the cervix. The uterine artery was tied
and the bed of the tumour drained.
Result - Recovery. Delivery at term.

100. 1908. Spaeth (72) - Aged 30. 5 months pregnant.
Married seven years.
Symptoms - Sudden severe abdominal pains accompanied
by vomiting
P.V. The cervix of the uterus was succulent. The body was enlarged, soft, and pushed to the right by a hard tumour the size of a foetal head, which was attached to the left side of the uterus. The fundus of the uterus could not be clearly made out.

Diagnosis - Twisting of an ovarian cystoma with pregnancy.

Operation - Enucleation of an interstitial myoma which was adherent to the omentum and surrounded by serous exudation and other signs of recent peritonitis. The uterus was twisted on its own axis through an angle of 180°. The uterus was replaced into its normal position. The bleeding was not profuse. The bed of the tumour was closed by two rows of catgur sutures.

Result - Recovery. Delivery at term.

101. 1908. Herbert Williamson (73) - Aged 35. 7 months pregnant. Married 15 months.


P.V. Two abdominal tumours; the larger on right was hard and nodular, the one on left soft and elastic like a pregnant uterus.
The cervix was soft and high up.

Diagnosis - Rapidly growing malignant ovarian tumour.

Indications for operation - (1) Embarrassment of respiration, (2) Impossibility of normal labour.

Operation - The tumour on the right was a pedunculated fibromyoma attached to the right side of the uterus and adherent to the parietal peritoneum, bowel and omentum. The free haemorrhage was arrested by underpinning the whole raw surface and closing it by means of catgut sutures.

Result - Recovery. Abortion two days after operation. On section the tumour shewed mucinoid degeneration and necrobiotic changes.

102. 1908. Boldt. (74) - 5 months pregnant.

Symptoms - of Threatening abortion.

P.V. Tumour in the lower segment of the uterus.

Operation Myomectomy.

Result - Recovery. Delivery at term.

103. 1908. Lewis (74) - 5 months pregnant.

Symptoms - "Pressure symptoms and pains"

P.V. A hard fibroid attached to body of uterus posteriorly, filled nearly half the pelvis, and could not be pushed above the brim. The cervix was pressed against the brim.

Operation - Enucleation of tumour.

Result - Recovery. Delivered at term.
104. 1908. Vincenzo Valdigni (75) - 4 months pregnant.
Operation - Enucleation of a tumour the size of an egg in the right horn of the uterus.
Result - Recovery. Delivery at term.

Result - Recovery. Delivery at term.

106. 1908. F.W.N. Fauntain (77) - Aged 35. 6 months pregnant.
Symptoms - Retention of urine and swelling of the lower extremities.
P.V. The pelvis was filled with a fibroid which pushed the uterus up into the abdomen. The cervix was above the pubes.
Operation - The pedicle of an incarcerated sub-peritoneal fibroid was transfixed and the tumour removed.
Result - Recovery. Natural Delivery at term.

107. 1908. Sir Wm. Smyly (78).
Operation - Enucleation during pregnancy of a fibroid the size of a billiard ball from the lower uterine segment between the layers of the broad ligament. Considerable haemorrhage.
Result - Recovery. Delivery at term.
108. 1908. Swayne (78) - Primipara. Aged 40, 5 months pregnant.
Symptoms - Pain and rapid increase in size of a solid abdominal tumour.
Operation - The pedicle of a pedunculated fibroid the size of an adult head was transfixed and the tumour removed by a V shaped incision.
A second tumour the size of a tangerine orange on the posterior uterine wall was enucleated.
Result - Recovery. No interruption of pregnancy two months after operation.

109. 1908. Swayne (78) - Multipara. Aged 35. 4 months pregnant.
Symptoms - Severe increasing abdominal pain and the presence of a pelvic tumour.
P.V. Two rounded projections, the one soft and on the right, the other hard and on the left, each about the size of a four months pregnancy.
Operation - Enucleation of a large fibroid growing from the right cornu. Axial rotation of the uterus had occurred which caused some difficulty in delivering the tumour, and would almost certainly have caused abortion.
Result - Recovery. Abortion two months after operation, without any serious complications.
In the foregoing list the final result to the mother has not been reported in two cases. Six deaths occurred in the 107 reported cases, which gives a maternal mortality of 5.2%.

The causes of death have been severe haemorrhage during subsequent abortion in two cases - 4 & 55. In three cases (2, 11 & 79) the patient died with symptoms of peritonitis, and in case 11 the heart and liver were found in a condition of fatty degeneration at the post-mortem examination. In Case 25 the cause of death has been aortic disease.

The subsequent course of pregnancy is mentioned in 104 cases, in which it was terminated in 21. This figure includes the 6 cases in which the mothers died, and gives an infantile mortality of 20.2%.

In Case 109 abortion followed two months after the operation and can hardly be considered as being caused by the operation.

Twins have been reported in two cases, viz., 62 & 67.

The youngest patient on whom myomectomy was performed was 21, and the oldest 44, the average age being 35 years 1 month.

The preponderance with which fibroid pregnancy is found in primiparae is remarkable.

Of the 55 cases in which the family history was recorded 28 were primiparae.
CONCLUSIONS.

As a general rule do not interfere with fibroids in pregnancy as most cases go to term.

If symptoms arise which justify interference never induce abortion.

In performing abdominal section consider the life of the child as well as of the mother, and do myomectomy wherever possible.

The mortality of hysterectomy during pregnancy is 4.87% higher than that of myomectomy and should only be performed when the life of the mother is in danger.
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