remembered that it is wellnigh impossible for any one investigator to conduct experimentation on a sufficiently large scale, and that it is therefore desirable that experiments of this kind should be multiplied so that out of a considerable series adequate data may be secured. So far as they go, the present figures tend to support the contention that the time of service in relation to the oestrous cycle is a factor of no importance in the matter of the determination of sex in the mammal.

Summary.

In an experiment designed to examine the sex ratio among individuals resulting from coitus during the first three hours and during the last three hours of oestrus respectively in the rat, no difference was noted between these two groups.

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DISCUSSION.

Dr. JAMES YOUNG (Edinburgh) thought that it was impossible to discuss Dr. Crew's paper until he had had time to read it and digest it. He looked forward to a further series of investigations by Dr. Crew of an even more complete nature.

The PRESIDENT (Dr. Haig Ferguson) complimented Dr. Crew on his most interesting paper, but was sorry that it should be thought that the male was the product of stale eggs.

Dr. CREW, in reply, thought that obstetricians would not be allowed to plead ignorance of this very important subject much longer. It was not the egg but the sperm which determined the sex, but any abnormality affecting the egg would upset the sex-determining mechanism.

UTERINE FIBROIDS AFTER THE MENOPAUSE.*

BY

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UTERINE fibroids may give rise to symptoms over a wide range of age, but in practice we find that a very large proportion of patients consult us for the first time between the ages of 45 and 50, and if we advise an operation the first inquiry of the patient is the possibility of an early menopause with the probability of cessation of symptoms. Naturally every patient wishes to avoid an operation, and every right-minded surgeon wishes to save her this ordeal, but he is expected to advocate the best method of treatment, and, in giving this opinion, he must not allow his judgement to be unduly biased by sentiment. In deciding for or against operation two important considerations must be borne in mind: first, the fact that with uterine fibroids the menopause is frequently delayed; and secondly, the possibility of malignant and degenerative changes occurring in the fibroids after the menopause. It is the second consideration with which I wish specially to deal.

The more experience I obtain in my work the more impressed am I with the serious complications which may occur in connexion with these tumours after the menopause. It is impossible to calculate the percentage of fibroids after the menopause which undergo serious changes, since we only see those patients in whom the fibroid is giving trouble; but, even if the percentage is small, we must give due weight to the fact that the removal of fibroids in a comparatively healthy woman before the age of 50 presents a very slight risk, whereas the same operation in a patient over 60, or still more over 70 years of age, for a fibroid which has undergone degenerative changes from which the patient's general health has suffered, is a very much more serious matter. My own belief is that a patient with a fibroid of moderate or large size will act more wisely in getting rid of it while in a good state of health than in running the risk of serious trouble developing at a later stage of life.

During the last six and a half years I have operated upon 62 patients for definite symptoms due to uterine fibroids after the menopause, and should have operated upon three others if their general condition would have permitted it; it is upon these 65 cases that I base this paper. During this same period I have been consulted by several patients in whom the fibroid was so small and the symptoms so slight that I have advised against operation; these cases are not considered. The majority of these 65 patients were between the ages of 50 and 60, but 8 were between 60 and 70 years of age, and 3 were over 70. In several instances patients complained of two symptoms, either of which was sufficiently severe to call for operation, so in discussing these symptoms separately these patients will appear in both sections.

General Ill Health: Patient not Fit for Operation.

There were three patients whose general health precluded the possibility of operation. One was 60 years of age, with recent haemorrhage from the tumour, but she had had a recent stroke, and even if the tumour proved to be malignant I did not feel justified in subjecting her to any operation. The second was also 60 years of age, and had severe pain in the lower abdomen, apparently arising from a uterine fibroid; but she was in a very feeble state of health with mitral regurgitation, and was not fit for an abdominal section. The third was an enfeebled woman, aged 72, with a fibroid almost filling the pelvis and with a slight degree of prolapse. Many years previously she was told she had a fibroid, but was advised not to have it removed. With advancing years the tumour dropped into the pelvis and produced more and more discomfort from pressure symptoms, and now she is a confirmed invalid, spending most of her life in bed or on the couch, and

* A paper read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

though possessed of all that wealth can give her, she drags out a miserable existence. Here, again, her general health precludes all possibility of operation, but if this had been performed twenty years ago she would now have been a healthy old lady, enjoying life, and a source of much greater happiness to herself and her family.

Malignancy.

There is considerable divergence of opinion about the incidence of malignant disease in uterine fibroids, but I think all will agree that a uterus which contains fibroids is much more likely to undergo malignant changes than one which is free from these tumours. I am convinced that the risk of this occurring in a fibroid uterus after the menopause is to be borne in mind when deciding for or against operation. In this series of 65 cases 6 had definite malignant changes in the uterus—3 sarcoma and 3 adenocarcinoma. Their ages varied from 49 to 56 years, and they had all passed the menopause several years.

The patient aged 49 years had an interesting history. Double oophorectomy was performed six years previously for haemorrhage due to a fibroid uterus; she was brought to me on account of recurrent haemorrhages and a thin watery discharge of almost one year's duration after five years' amenorrhoea. I found the cervix dilated by what I thought to be a fibroid polypus. I performed a panhysterectomy and found the fibroid polypus to be a sarcoma. The patient died of recurrence about four months later.

Sarcoma of uterine fibroids occurs much less frequently than does carcinoma of the body or cervix in uteri with fibroids, and it is curious to find in this small series that the two types of growth were present in equal numbers. If I investigated the figures over a longer period of years I am sure the proportion would be different.

Haemorrhage after the Menopause without Malignant Changes.

This is by far the commonest symptom, and in this series 24 complained of bleeding which commenced some time after the menopause; in 6 cases this was associated with other symptoms, which are mentioned in succeeding paragraphs. These patients varied in age from 47 to 68 years. The usual history was simply recommencement of bleeding after a number of years of amenorrhoea, and, as the only physical sign was enlargement of the uterine body with the fibroid, it was impossible to say whether that fibroid was undergoing malignant change or not, unless the patient was anaesthetized and a diagnostic curetting was performed. In these cases I do not think that this would be good treatment, since an early adenocarcinoma is easily overlooked, while a sarcoma cannot usually be detected; moreover, a uterine fibroid which becomes active after the menopause, and produces haemorrhage, is not likely to be benefited by curetting, and is much better removed.

Acute Pain.

Nine patients complained of acute pain in the lower abdomen; in two this was associated with haemorrhage and in one with rapid enlargement. All these tumours showed advanced degenerative changes, two with red degeneration, while two had a subperitoneal fibroid with twisted pedicle. In each case the pain was acute and called for early operation.

Chronic Pain.

Some patients complained chiefly of this symptom, principally in the lower abdomen and back, and, in some cases, radiating down into the leg. These patients, on the average, were older than those in the preceding group; in the majority of cases, no doubt, the fibroid had diminished in size since the menopause, and was producing symptoms by pressure inside the pelvis. Three of these patients complained of other symptoms in addition to this chronic pain, but in all this symptom was of such severity that they desired operative treatment, even though one was 72 years of age.

Torsion of the Uterus.

This is a very rare complication, but by a curious coincidence I have had two cases within six months, and

it is worth giving a short note of each, as they illustrate different types of onset, one acute, the other subacute.

The first patient, an unmarried woman aged 70, passed the menopause when she was 56, and was told before this age that she had a fibroid, but was advised not to have it removed. For sixteen months there had been recurrent attacks of abdominal pain with sickness, and on this occasion she consulted her own doctor, who found a hard, tender tumour, which the patient said had increased in size. This tumour extended up to the umbilicus and was so tender that I made a diagnosis of red degeneration. On opening the abdomen I found the uterus contained an interstitial fibroid at the fundus, about the size of a foetal head, and that the uterus, with its broad ligament, tubes, and ovaries, had twisted round in two complete circles at the level of the internal os, where they were attached to the cervix by a pedicle no thicker than my first finger. The uterus, tumour, and appendages were deep purple, almost black, in colour, and were easily removed by cutting through this small pedicle. In spite of her age and the severity of the condition the patient made an uninterrupted recovery.

This is a curious case, as there was no history of acute onset, merely recurrent attacks of abdominal pain and sickness extending over sixteen months, and this last attack was little if any more severe than her previous attacks from which she had recovered.

The second patient, also unmarried, was 56 years of age, and had passed the menopause two years previously. When I saw her there had been severe abdominal pain for two days, which was made much worse by her journey to see me; she was so ill that I sent her at once into a nursing home. As in the last case this patient had a hard, tender mass arising from the pelvis to the level of the umbilicus, and I found when the abdomen was opened that she also had a single interstitial fibroid, the size of a foetal head, developed in the fundus. The uterus, fibroid, broad ligaments, and tubes were greatly distended and almost black in colour; they were twisted round in one complete circle at the level of the internal os. The tumour was easily removed, and the patient made an uninterrupted recovery.

Torsion of the Pedicle of Subperitoneal Fibroids.

Two patients, one aged 53, the other 54, were operated upon several years after the menopause for acute abdominal pain due to a subperitoneal fibroid with torsion of its pedicle.

Pressure Symptoms.

Uterine fibroids, after the menopause, shrink in some cases sufficiently far to allow the tumour to fall into the pelvis and so produce pressure symptoms, which may manifest themselves in various ways:

Retention of Urine.—Four patients suffered from acute retention of urine which had required the passage of a catheter. In all cases the fibroid was well down in the pelvis, and no doubt before the menopause it had been of sufficient size to be held above the pelvic brim.

Pressure on Rectum.—Two patients complained of severe rectal symptoms, which had commenced some years after the menopause, and in each case there was a uterine fibroid lying in the pelvis and pressing on the rectum.

Bearing Down.—Two patients complained chiefly of this symptom, though in one case there was also severe flooding. Both patients had passed the menopause several years and the symptoms had only occurred after this period. In these cases no doubt the symptoms were directly due to the post-menopausal shrinkage of the tumour, which allowed it to fall to the bottom of the pelvis.

Sometimes after the menopause the tumour increases in size, and this also may produce pressure symptoms.

Frequent Micturition.—Two patients complained of this symptom. In one the tumour extended almost to the sternum and was very soft, evidently undergoing degenerative changes, whilst the other was smaller in size but extended into the abdomen, and, in addition, was giving rise to much aching, dragging pain.

Swollen Legs.—One patient complained of swollen legs, and had a large, soft fibroid extending up to the umbilicus which was enlarging rapidly.

Increased Size of Tumour.

Nine patients had noticed recent rapid increase in size of the tumour. Several years had passed since the menopause, and the increase in size was due in each case to degeneration of the tumour, usually cystic in nature. The rapid increase in the size of the tumour was accompanied by haemorrhage in two cases and by pain in three.

Degeneration Followed by Infection.

It is to be expected that a fibroid which has undergone degenerative changes would readily become infected, and this is a danger to keep in mind; but in this series I have only one patient who had a rise of temperature before operation. In this instance the fibroid had undergone red degeneration—a type which readily becomes infected. Probably the small incidence of this complication is due to the degeneration producing other symptoms which called for operation before the tumour had time to become infected.

Absorption from Degenerated Fibroids.

This is a very common occurrence. In this series I have three patients who were operated upon for this cause alone, though no doubt many of the other patients were suffering from absorption in addition to the more urgent symptoms which called for operation. Each of these patients suffered in general health—loss of appetite and loss of weight, and they were anaemic. All had degenerating fibroids and improved in general health after removal of these tumours.

Ascites due to Calcareous Degeneration.

This is a condition I have met with occasionally, and though it does not occur in this series should be mentioned. Occasionally in a patient with ascites there can be felt a hard tumour of pelvic origin, which is diagnosed as a malignant ovarian tumour, but proves to be a subperitoneal uterine fibroid which has undergone calcareous degeneration, and by its hardness has so irritated the peritoneum as to produce ascites.

Tenderness after Radium.

A patient, aged 52, had been treated by radium two and a half years previously for haemorrhage due to uterine fibroids. Since this treatment she had complete amenorrhoea, but complained of severe pain in three abdominal scars due to radium burns, and great tenderness in the uterus, which produced severe dyspareunia. The uterine fibroid was quite small and I did not advise any operation; but I think the case should be mentioned to illustrate the fact that treatment by radium, so strongly advocated by some authorities, is not entirely devoid of risk.

This is my experience of post-menopausal trouble from uterine fibroids during the last six and a half years—on the average ten cases each year sufficiently severe to require operative intervention. The number may not seem very large, but when we consider the increased risk of the operation in patients of advanced age, with resistance still further reduced by changes in these tumours, I do feel that this should have considerable weight with us when deciding whether a patient with a fibroid uterus before the menopause should be advised to have it removed. I give it as my considered opinion that it is much safer for a woman with a fibroid of moderate or large size (quite apart from any symptoms it may be producing at the time) to have it removed before the menopause than to run the risk of malignant or degenerative changes, which so frequently occur after the menopause.

DISCUSSION.

Dr. BETHEL SOLOMONS (Dublin) was struck by the large percentage of malignant changes in Professor Shaw's series, which seemed to show that those who favoured the treatment of fibroids by x rays were acting on the wrong lines. Whereas in many cases after the menopause hysterectomy was no doubt the best operation, he thought that in isolated instances myomectomy might be preferable. He warmly advocated the use of stovaine in these cases.

Professor LOUISE McILROY (London) agreed with what had been said; she was convinced that fibroids were caused by toxæmia. She related the case of a submucous fibroid in an enfeebled patient being successfully treated by pituitary extract, quinine, and castor oil, as for the induction of labour.

Professor GIBBON FITZGIBBON (Dublin) was inclined to think that some of these cases were of actual post-menopausal growth, and not necessarily changes in fibroids. It was worth remembering that many women aged from

38 to 40 might nowadays get married, and it was therefore a question whether they should postpone an operation until after the child-bearing age.

Dr. W. FORDYCE (Edinburgh) questioned whether malignant changes were generally so common as Professor Fletcher Shaw's figures suggested. His own experience of fibroids undergoing malignant changes was so limited that the risk might almost be ignored. If malignancy was so common, then operation should be performed for small fibroids and not reserved only for large ones.

Dr. J. YOUNG (Edinburgh) thought that only a very small proportion of fibroids underwent malignant changes after the menopause. He also was strongly in favour of spinal anaesthesia in old and feeble patients.

Dr. J. H. FERGUSON (Edinburgh) had seen three cases of torsion of subperitoneal fibroids and three cases of torsion of the uterus itself. One of the complications of torsion was collapse from haemorrhage.

Professor FLETCHER SHAW, in reply, expressed surprise at the unanimity of those taking part in the discussion. In regard to the occurrence of malignant degeneration in fibroids, it was a very vexed question how frequently this occurred. Statistics varied enormously. His own impression was that a fibroid uterus was much more likely to undergo malignant changes than a non-fibroid uterus. He was not so convinced that malignant change was so common that every fibroid should be removed, but he thought it warranted operation in the case of the larger fibroids. In regard to anaesthesia, he agreed that the spinal method was the most suitable unless the services of an artist in general anaesthesia were available.

SOME POINTS IN THE TECHNIQUE OF THE LOWER SEGMENT CAESAREAN OPERATION.*

BY

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THE lower segment Caesarean operation is such a valuable procedure that it is necessary to bring its advantages and disadvantages constantly before the medical profession, especially in view of the fact that it is neither practised nor recommended in some of the larger hospitals which devote themselves to the teaching of students. No more illuminating argument for the advantages in the operation can be brought forward than the change in opinion of that broad-minded and brilliant obstetrician Munro Kerr, who, in his *Operative Midwifery* (1916) stated that he believed that it would entirely disappear and be forgotten unless the cicatrix in the lower segment was decidedly stronger than the one situated in the upper part of the body of the uterus. He is now well known as a strong supporter of the low segment operation.¹

It is necessary to discuss various points in technique as they arise, in order that some definite mode of performing the operation may be standardized to some extent.

One of the most instructive communications in recent years is the paper by Harris and Brown on the bacterial contents of the uterus.² They show in this that the classical operation is the safest when performed at the time of election, and that the bacterial content of the uterus becomes greater and advances higher the longer the woman is in labour. This might appear at first reading to be a reason for the adoption of the classical operation, but a moment's thought will dismiss this fallacious idea from the mind; for no matter in what part of the uterus the infection lies, be it high or low, it is obvious that the incision should be in the comparatively innocuous lower segment covered with bladder peritoneum rather than in the upper abdomen in close proximity to the intestines, with the likelihood of general peritonitis. These remarks apply particularly to placenta praevia. In this short series a central insertion of the placenta was

* A paper read in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Edinburgh, 1927.