parasympathetic fibres at first below as they lie upon the pelvic plexuses, and from this point to trace them upwards. If the dissection is made in the reverse direction it is easy to damage the fibres or to fail to find them. Thus it seems quite clear that the main path for the parasympathetic fibres to the distal colon is independent of the presacral nerve, and consists of a small but definite trunk, which comes from the pelvic splanchnic nerves of the two sides and, after piercing the pelvic plexuses, ascends on the left side of the hypogastric plexus.

CLINICAL APPLICATION OF THESE FINDINGS

Several surgeons have attempted sympathetic denervation of the distal colon by operation on the presacral nerve, and/or a perivascular stripping of the origin of the inferior mesenteric artery carried for a distance along this vessel, which ranges, in different descriptions, from a half to one inch.

Apart from the very important fact that presacral neurectomy should not be done for this purpose in males, it is further evident that the operation might involve section of the parasympathetic supply of the distal colon. This undesirable sequel might happen if the surgeon were to carry out the excision too generously in a lateral direction or, conversely, if by any chance the parasympathetic fibres were running more medially than normal. Further, if a perivascular stripping of the inferior mesenteric artery be pushed too far along the vessel the parasympathetic supply will be destroyed.

A second method, which has been followed by other workers, is the excision of the lumbar sympathetic cords. This gives excellent results in cases of Hirschsprung's disease, and in this respect our experience has been in entire accord with the results of other and older workers. But it is at least open to question whether the beneficial results are not due entirely to the section of the lumbar splanchnic nerves, which must be divided if the excision of the sympathetic cord is carried to a proper height. It is, we think, sufficient to divide only the lumbar splanchnics; a method first suggested by Wade, who, however, at least in his earlier cases, attacked only the left side, and laid stress on the division of the white (preganglionic) ramus from the first lumbar nerve.

It is often urged, and with some justice, that sympathetomy as at present performed is unnecessarily destructive. That this is so is due to the want of more exact anatomical knowledge. The surgeon is driven to do more than is requisite and necessary in order to ensure that enough is done. With increasing knowledge and experience deliberate ramisectomy should tend to replace the cruder methods of cord ganglionectomy.

It may be possible to denervate the arm of its sympathetic supply without presenting the patient with an unwanted and disfiguring Horner's syndrome. Similarly, a simple deliberate section of the lumbar splanchnic rami will, we believe, prove sufficient to cure cases of Hirschsprung's disease without involving the unwanted by-product of a permanent vaso-dilatation of the lower extremities.

This anatomical inquiry is, we think, a definite contribution to our knowledge of the innervation of the distal colon, since it has not only displayed for the first time some exact information about the parasympathetic supply, but has thrown further light on the safest and surest route by which the sympathetic supply may be cut without endangering any fibres of the parasympathetic.

REFERENCES

- 1 Trumble, H. C.: *Med. Journ. of Australia*, 1931, ii, 405.
- 2 Davis, A. A.: *Journ. Obstet. and Gynaecol. British Empire*, 1933, xl, No. 3, 481.
- 3 Elant, L.: *Surg., Gynecol. and Obstet.*, 1932, lv, 581.
- 4 Thompson, McLaren: *The Practitioner's Library of Medicine and Surgery*, 1932, vol. i.

A STUDY OF HYSTERECTOMY BASED ON THE AFTER-HISTORIES OF 112 CASES *

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This investigation was undertaken with a view to finding out how far these patients were satisfied with the result of their operation; how severe their menopausal symptoms were; whether the removal of the ovaries along with the uterus was justifiable; how far sex relationship and sexual feelings were altered; and whether obesity frequently followed. Some other findings of interest are recorded. One hundred and ninety-five consecutive cases of hysterectomy operated on in hospital by the writer during eight years received a single invitation to attend in the spring of 1933; of these 112 attended—a fairly representative number, considering change of address, weather, sickness, etc.—and were submitted to a questionnaire with their old notes in front. The analysis of the tabulated facts is as follows.

Indications for Operation

Carcinoma of cervix uteri...	...	...	...	1
Malignant disease of corpus uteri	...	...	...	2
Fibroids	...	...	...	37
Post-menopausal haemorrhage	...	...	...	2
Placental mole	...	...	...	1
Double pyosalpinx	...	...	...	1
Double retroperitoneal cysts	...	...	...	1
Endometritis, salpingo-oophoritis, and endometriosis	...	...	...	67

Nature of Operation

Vaginal hysterectomy	...	...	...	4
Subtotal hysterectomy	...	...	...	98
Panhysterectomy	...	...	...	10
Both appendages removed	...	...	...	91
Neither appendages removed	...	...	...	12
Appendages of one side removed	...	...	...	9
Appendix removed	...	...	...	85
Appendix not removed	...	...	...	12
Appendix removed previously	...	...	...	15

Age Incidence

20-25	...	...	2	40-45	...	...	31
25-30	...	...	5	45-50	...	...	14
30-35	...	...	19	50-55	...	...	11
35-40	...	...	28	55-65	...	...	2

Successful and restored to work	...	...	...	109
In indifferent health	...	...	...	3

Menopausal Phenomena

Negligible or non-existent	...	...	...	29
Slight	...	...	...	17
Moderate or mild	...	...	...	27
Severe	...	...	...	35
Post-menopausal cases	...	...	...	4

Nature of Menopausal Symptoms

Flushings and sweatings	...	...	...	83
Headache	...	...	...	30
Dizziness	...	...	...	10
Irritability	...	...	...	1
Nervousness	...	...	...	11
Mental upset	...	...	...	1
Miscellaneous	...	...	...	7

In 11 cases only one of the above symptoms was present; in 42, two only; in 20, three only; in 6, more than three; in 29 the symptoms were negligible; and 4 were beyond the menopause.

Effect on Weight

Stationary	...	...	...	25
Slight increase	...	...	...	50
Considerable increase	...	...	...	29
Loss of weight	...	...	...	8

Married or Not

Married or widow	100	Unmarried	...	12
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* Read before the North of England Gynaecological Society, February 23rd, 1934.

Sexual Relations (80 Possible Answers)

Discontinued	20
Indifferent	5
Normal	55

Sex Feelings (64 Possible Answers)

Increased	3
Unchanged or normal	34
Diminished	11
Disappeared	16

Backache

Symptom of note before operation	37
Completely cured	30
Improved	3
Unaffected	4

Leucorrhoea

Present before operation	50
A leading symptom before operation	26
Cured	45
Uncured	5

Frequency of Micturition

Completely gone	28
Uncured	2

Dyspareunia

A leading symptom	16
Cured	9

INDICATIONS FOR OPERATION

The precise indications for hysterectomy vary according to the point of view of the surgeon. In this series, for example, there is only one case of cancer of the cervix uteri; nearly all cases during those eight years were treated with radium. Some uncomplicated cases of severe menopausal haemorrhage were also treated with radium. Certain cases of fibroids were treated by myomectomy instead of hysterectomy. On the other hand, the group of cases classed as endometritis, salpingo-oophoritis, and endometriosis is perhaps relatively large, and calls for explanation. It is drawn from women who present themselves in fair numbers at the out-patient department. Their health is being steadily undermined by pelvic pain, dysmenorrhoea, and menorrhagia; backache, leucorrhoea, frequency of micturition, and dyspareunia (if inquired about) being often added to the picture. The menstrual period has become a burden; each period is a blow to their physical and nervous energy, and they recover incompletely before the next blow arrives. They drift steadily towards ill-health, and become debilitated, unhappy, and neurotic. To these women, in selected cases, hysterectomy is a tremendous boon, and restores them to comfort and fairly sound health.

Care must be taken to exclude the neurotic woman who has centred her neurosis upon her pelvic organs, and to exclude cases in which less drastic treatment may be effective. Hysterectomy must not be resorted to without the intelligent consent of the patient, and, if married, of her husband, and the co-operation of her doctor. The fact that these cases are far commoner in hospital than in private work shows how greatly the conditions of life react upon pelvic symptoms; no doubt a sea voyage and an easy healthy life would relieve many. Hysterectomy is regrettable, but the verdict of almost every woman in this group of sixty-seven cases was unhesitatingly, often enthusiastically, in praise of the operation. Many of them have had one or more children, and date their troubles from infection at childbirth. Not a few have had one or more operations, and are in danger of "post-operative neurasthenia."

The pathology of the condition is complicated. Most of the specimens were microscopically examined, and hyperplasia of the uterine mucosa, small-cell infiltration of the uterine wall, and endometrioma of the ovaries were among the conditions most frequently reported. It may

be argued that where the uterus is not greatly enlarged an artificial menopause induced by α rays or radium would suffice, but, as Green-Armytage¹ points out, the difficulty of exact diagnosis between endometrioma, malignant disease, inflammatory conditions, and fibroids, is an argument of weight in favour of operative treatment. When the uterus has fulfilled its essential function of child-bearing or ceased to be capable of producing children, and the pelvic organs have become a tax on a woman's physical and mental well-being, hysterectomy is an invaluable method of restoring health, and should not be delayed until prolonged pelvic trouble has inflicted serious permanent damage on the nervous system.

TYPE OF OPERATION

Much discussion has recently centred on this subject. Vaginal hysterectomy, though largely in disuse, gave in the four cases a speedy convalescence; it is apt to throw more strain on the surgeon than on the patient. Subtotal hysterectomies numbered ninety-eight: panhysterectomies ten; where the cervix was badly torn panhysterectomy was preferred. It may be noted that leucorrhoea was cured in forty-five out of the fifty cases where it was complained of, and its cure did not seem to depend on whether the cervix was removed or not. The appendix was always removed if still present, unless there was reason for haste; to leave it as a routine procedure seems to me a serious and, I might almost say, a culpable omission.

The question of whether ovarian tissue should be left or not when hysterectomy is performed may be regarded as still *sub judice*, although the trend of recent opinion is distinctly in favour of conserving ovarian tissue. In this series the menopause was severe in seven cases out of seventeen (41 per cent.) in which ovarian tissue was left, and in twenty-eight cases out of ninety-one (32 per cent.) in which both ovaries were removed. Obesity occurred in eight cases (48 per cent.) in which ovarian tissue was left, and in twenty-one (23 per cent.) in which both ovaries were removed. So far as this series of cases is concerned, the conservation of ovarian tissue did not appear to influence for good the severity of the menopause, the occurrence of obesity, or the loss of sexual feeling. In many cases of hysterectomy where the ovaries are not removed, it appears that the latter, their main objective the uterus being gone, atrophy sometimes at once, often within a year or two, sometimes later. I have seen a woman of 50, who had undergone hysterectomy twelve years before, have a secondary menopause begin as late as at 48, and continue still very troublesome two years later. This small series of cases does not support the view that ovarian tissue should be conserved at the operation of hysterectomy.

MENOPAUSAL SYMPTOMS

It would be unfair to expect in a series such as this, where the condition of the patients was such as to lead to the performance of hysterectomy, that the artificial menopause would be nearly as uneventful as in an equal number of average healthy women. I believe that the woman who has lived a healthy life, physical and mental, passes through the menopause with comparatively little discomfort.

In this series the menopause was found to be negligible in 27 per cent., slight in 16 per cent., moderate in 25 per cent., severe in 32 per cent. There was one very constant feature in the cases where the menopause was severe; these patients had suffered repeated trauma to the nervous system, often for years, either from severe dysmenorrhoea, or a hard and overwrought life, or other cause (sometimes

marital) of chronic nervous exhaustion. Anaemia, even a high degree of anaemia, did not *per se* favour a stormy menopause. No other common factor was found to exist in these cases, and there seems good ground for concluding that the essential cause of a severe menopause is an exhausted nervous system.

OBESITY AFTER HYSTERECTOMY

The figures show that obesity is by no means a necessary sequel of this operation, a considerable increase in weight occurring only in twenty-nine cases (25 per cent.). A further analysis showed that obesity had no relation to the severity of the menopause, the persistence of sex feeling, or the conservation of ovarian tissue. The menopause was severe in ten cases (34 per cent.), moderate in six (22 per cent.), slight in five (17 per cent.), negligible in eight (27 per cent.). Sexual feelings were normal in seven out of seventeen (41 per cent.), lessened in six out of seventeen (35 per cent.), and disappeared in four out of seventeen (24 per cent.). Obesity occurred in eight of the twenty-one cases in which ovarian tissue was left (38 per cent.), and in twenty-one out of the ninety-one "clean sweep" operations (23 per cent.). But it occurred in twenty out of the fifty-four cases under 40 years (37 per cent.), and in nine out of the fifty-eight cases over 40 (15 per cent.). So that patients under 40 were more than twice as liable to obesity as those over that age. In certain cases the cessation of the debilitating menstrual period, apart from any specific action of the reproductive hormones, may tend to an increase in weight. Dr. Margaret Sharp informs me that at the Eldwick Sanatorium patients almost always lose weight during menstruation, even as much as 2 lb. during a menstrual period of a week's duration. I believe that if one of the well-known "slimming" diets were put in the hands of those patients, many of them could thereby compensate for the change in metabolism, and would willingly take the trouble to do so.

HYSTERECTOMY AND SEX INSTINCT

My interest in this aspect of the subject was aroused ten years ago, when, after I had recommended hysterectomy for a fibroid, a friend of the patient said: "I am sorry you have suggested this operation, because ever since you did it for me I have lost my sex feelings." I then became interested to know in what proportion of cases these were lost. It was not, of course, possible to ask all the patients, the unmarried ones, widows, etc. In the sixty-four cases in which an answer was possible, these feelings remained unchanged or normal in thirty-four (53 per cent.), increased in three (5 per cent.), diminished in eleven (17 per cent.), and disappeared in sixteen (25 per cent.). I am not acquainted with any figures relating to the effects of the normal menopause, but I doubt if they would be better than these. Simply from the point of view of sex, the disadvantage of an early menopause may be thus stated: that in those women who are destined to lose their sex feelings at the change of life it is a matter for regret to antedate this loss by five, ten, or twenty years, but it is certain that no such loss need necessarily occur.

Is a woman unsexed by hysterectomy? In order to reply we must ask what constitutes a woman? If it be the capacity to bear children, seeing that in the great majority of these cases this capacity is lost before operation, it cannot be said that hysterectomy unsexes them. If the power to consummate marriage be the test, they are not unsexed, since many women after the "clean sweep" operation retain their sex feelings and marital relationships as before. I had occasion to perform a

hysterectomy for fibroids with removal of both appendages in a woman of 53. Her husband came specially to ask me if the operation would rid her of her amorous tendencies, which greatly embarrassed him. She was the mother of six children. Two years later he informed me that she was unchanged in this respect.

It is natural to think that a complete set of ovaries and the associated endocrine glands is necessary for the building up of the complex emotional nature of woman, although in the hermaphrodite this view is difficult to maintain. A male pseudo-hermaphrodite came to consult me because she wanted to get married, and was aware (never having told anyone) that she was part man and part woman. I removed a rudimentary penis and a gland from the right "labium," shown by the microscope to be a testis, and so made her a fairly presentable female. Pelvic examination showed that she possessed neither uterus nor ovaries; but she had the emotions and sex attractions of a woman, and soon after she married. It is hard to explain this case, or the fact that removal of uterus and ovaries abolishes the sex instinct in some women and not in others. That femininity can develop without uterus and ovaries, and can remain after their removal, appears certain, and it must therefore be concluded that hysterectomy does not unsex a woman.

NEUROSIS AFTER HYSTERECTOMY

Hysterectomy is peculiarly exposed to the charge of setting up a post-operative neurosis. It is performed often at the time of the menopause, the unstable period of a woman's life, and in any case brings about an artificial menopause. The subjects are unhealthy, sometimes physical wrecks, and the conditions of life to which they return, as regards work, poverty, family cares, etc., are often unfavourable to a proper convalescence.

Certain types of neurosis may be referred to. Morbidity owing to loss of the reproduction organs should be prevented by careful explanation before operation. Hysterectomy is the most important operation that can be performed upon a woman, and calls for the full and informed consent of the patient, and her husband (if any), and the co-operation of her doctor. To the patient it means the cessation of the menstrual flow, a definite landmark often regarded as separating youth from age, and one of which she is reminded month after month. It means the loss of the capacity to conceive. The maternal instinct (represented by Epstein as *Genesis*) is the guiding spirit of woman, and consciously or unconsciously, moulds all her feelings, emotions, and actions, and the giving up of the power to reproduce the race is to most women a definite act of renunciation. The husband ought to be consulted. Legally, indeed, he has no right either to compel his wife to have an operation or to prevent her. Actually, he is entitled to a full explanation. In some of the cases of this series, patients who have lost their sex feelings have said: "But I have a good husband, and he really doesn't care; he is so pleased to see me well." The family doctor must be in accord; it is wrong to remove both ovaries if he disapproves. The convalescence after hysterectomy is necessarily longer than after the average operation, and the patient more open to the influence and suggestions of the family doctor; it is therefore more than usually important that the operation should have his full approval.

Good operative technique and post-operative care assist in eliminating subsequent neurosis. Patients should be warned that it may take a year or more for them to reap the full benefit of the operation, and that for a time they will suffer from menopausal symptoms. Convalescence should be carefully graduated up to complete restoration

to health. Patients are often told not to "do too much." This elusive phrase really means that they must not incur more fatigue in any one day than they can completely recover from by virtue of the rest of the succeeding night—an important principle in any convalescence. The cutting down of social duties, the abolition of late nights, a period of complete rest lying down in the middle of the day, and a change of air facilitate an early cure. Here are some types of the neurotic condition that may follow hysterectomy.

Case 1.—A married woman, aged 49, a midwife in active practice, had a hysterectomy for menopausal haemorrhage. A few months later she was readmitted to hospital, and a very careful house-surgeon investigated her case with much detail. She remained seven weeks without benefit. At the end of a year she was a chronic invalid. One day her doctor said to her: "Mrs. A, I have had more than enough of this. I am satisfied you have nothing at all wrong with you. You have had your surgeon and myself at your tail for long enough. I shall attend you no more unless you are really ill. Get another doctor if you like. My advice is 'Get along, and do your work. Good-bye.'" From that day, now ten years ago, she has worked and is in good health.

Case 2.—A single woman, aged 26, had hysterectomy performed for an extreme degree of anaemia due to menorrhagia, which was threatening her life. She recovered slowly, but remained dull, listless, and apathetic. A few years after, her sister had a child, and with her interest in her sister's child she lost her neurosis and regained her youth.

Case 3.—A doctor's wife, aged 39, had suffered from severe dysmenorrhoea and menorrhagia for years, and became so ill that her husband was afraid, and not without reason, that she would not survive another period. After hysterectomy, for fibroid, with removal of the appendages, she gradually recovered, despite occasional attacks of tonsillitis, and mild rheumatic symptoms. Every three months she was able to recognize her periods from the old depression and malaise, and an exacerbation of flushings and sweatings. Several ovarian extracts had been tried without benefit. Four years after operation ovarian emplettes (Parke, Davis and Co.) were given, and at once improved her nervous tone and general health, and the old periods became unrecognizable.

Some years ago I was invited to lecture to the Chartered Society of Massage and Medical Gymnastics on "hysterectomy." This choice of subject surprised me. I was told that so many cases of hysterectomy were referred to them for massage that they wanted to know the surgeon's point of view; they stated they believed that a certain degree of neurosis was an inevitable sequel of all abdominal operations, excepting perhaps an uncomplicated appendicectomy. Such a criticism ought to stress the methods of preventing neurosis underlined in this paper. It must be borne in mind, however, that neurosis, and even mental upset, may exist apart from operation or at the menopause.

Four cases of mental upset of varying degrees occurred in this series. One began six months before operation, which was in itself beneficial. Another patient had mucous colitis and fits before operation, and remained somewhat neurotic. A third developed fainting attacks with loss of consciousness at rare intervals after an operation otherwise successful. The fourth developed an anxiety neurosis two or three months after operation; this is still improving after eight years. These last three cases are classed above as in indifferent health.

LEUCORRHOEA, BACKACHE, FREQUENT MICTURITION

The high cure ratio of these common and very distressing symptoms was remarkable. Leucorrhoea was cured in forty-five out of fifty cases (90 per cent.); backache cured in thirty and relieved in three out of thirty-seven cases (90 per cent.); frequency of micturition cured in twenty-eight out of thirty cases (93 per cent.). I have

no data by which to interpret this curiously high percentage of cure. It is interesting to note that in the treatment of the "gynaecological" backache Young² finds that repair of the torn cervix is very effective, whereas in nearly all these cases the cervix was left.

ADDITIONAL NOTES

Several patients thought they could identify the time of their periods for some months after operation. One stated she lost blood from her nose for many months at intervals corresponding to her periods. An occasional case had gall-stones, which were not removed at the same time. Upper vaginal prolapse was cured by the operation. Some patients had previously had operations for prolapse; others had subsequent operation for prolapse of the vaginal walls. Only one case required a laparotomy consequent on the hysterectomy—namely, for acute obstruction, after eight years. The old notes were investigated, and it was found that she had some vomiting and distension for a few days after the original operation; she had never been really well since. At the second operation there were adhesions of the small intestine in the pelvis. Such a result, accruing no doubt from a post-operative ooze, emphasizes the need for a careful technique. This patient's troublesome symptoms completely disappeared after her second operation. The absence of any complaint about constipation was remarkable. Only in two or three cases was it complained of, and in each of these adhesions of the sigmoid had been noted as present at the time of operation. There was no complaint of menopausal rheumatism; neither was there any mention of symptoms of atrophic vaginitis.

MORTALITY, ETC.

For the sake of completeness the records of the remaining eighty-three cases were investigated. There were three deaths, one of which was due to the anaesthetic, giving a death rate of three in 198, or 1.5 per cent. These remaining cases included eleven of malignant disease of the body or cervix, and one rare condition, a large angioma of the body of the uterus.

SUMMARY

1. An analysis is given of the after-histories of 112 cases of hysterectomy.
2. In the light of the facts as ascertained controversial questions such as whether ovaries should be removed or left are reviewed.
3. The effects of hysterectomy as regards obesity and sex feelings and menopausal phenomena are investigated.
4. The factors that lead to a uniformly successful result are discussed.
5. The mortality of the total series of 198 consecutive cases of hysterectomy was three, or 1.5 per cent.

I wish to express my thanks to my house-surgeons, especially Mr. Richard Saunders, for valuable assistance.

REFERENCES

- ¹ Green-Armytage, V. B.: *British Medical Journal*, 1933, i, 604.
- ² Young, J.: *Ibid.*, 1932, i, 683.

Food Investigation Special Report No. 43, on the storage of meat in small refrigerators, has been issued by the Department of Scientific and Industrial Research (H.M. Stationery Office, 9d.). This explains why meat sometimes fails to keep for a reasonable time in small refrigerators, such as butchers commonly use. While a refrigerator may be sometimes misused by overloading or otherwise, the most frequent cause of wastage is heavy infection of the meat by micro-organisms. The report shows how this infection comes about, and how it can be avoided.