2. A division has been made into "dry" cases in which there is no expectoration and "septic" cases in which the sputum is purulent. These do not bear an exact relation to the x-ray cylindrical and saccular varieties, which largely depend for their prognosis upon the infective factor. Those infected cases which have progressed to copious foul sputum are classed as "fetid."

3. Cases with occasional sputum, here classed "simple," are shown to have as bad a prognosis as those persistently septic.

4. Ten of our fourteen dry cases treated medically have become infected within six years, and of these three patients are dead and two totally incapacitated.

5. Cases with infected sputum, whatever the anatomical distribution of the disease, progress, with rare exceptions, steadily to a fatal issue if treated medically.

6. Bronchiectasis with only medical treatment is an extremely fatal disease, for out of forty-nine patients twenty-three are dead and nine totally incapacitated, and of the remainder only four are "dry" after five years from diagnosis.

7. In order to secure early diagnosis, all doubtful cases of haemoptysis and cough in which tuberculosis has been excluded by a single x-ray photograph should be x-rayed again after injection of lipiodol, making sure that a lateral skiagram is taken in those cases in which antero-posterior screening shows an apparent unilobar distribution of the opaque medium.

8. Phrenic evulsion alone is of doubtful value, and not indicated if the operation of lobectomy is at all possible. It is better combined with artificial pneumothorax.

9. Thoracoplasty may, and sometimes will, prolong the life of a patient with advanced unilateral disease, and will certainly make existence more tolerable for the patient and his relatives; it should never be performed for unilobar disease.

10. Artificial pneumothorax is mainly useful as a preliminary to lobectomy.

11. Lobectomy has proved to be the greatest advance in the treatment of this condition, but depends upon diagnosis with certainty at an early age and experienced attention to pre- and post-operative measures.

We are indebted to the physicians and surgeons on the honorary staff of the Brompton Hospital for permission to use their cases and for their advice, and to Dr. Stanley Melville and the staff of the x-ray department for their co-operation in the matter of lipiodol examinations and for their reports. Dr. Thomas Larkworthy has been of great assistance in collecting cases and in carrying out some of the lipiodol examinations; and we are grateful to the staff of the lady almoner's department and to Miss Spero, research clerk, for the follow-up work.

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HYSTERECTOMY: A CRITICAL SURVEY

WITH A REPORT OF 210 CASES*

BY

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The operation of hysterectomy has gained greatly in popularity within recent years. It is so extensively employed that its indications have far passed the confines of the original textbook teaching. It is therefore necessary to pause and to examine its present status, to evaluate its results, and to determine its safety and after-effects. In order to do so I have made a survey of my own hospital and private cases for the past seven years, and have sent out a questionnaire to as many patients as possible. An inquiry was made into the general health since operation, the occurrence and severity of the surgical menopause, and especially into the sexual life following the ablation of the uterus. I have endeavoured to analyse the symptoms complained of, the indications for operation, and the type of operation with its immediate and remote results. I have read through a considerable quantity of the literature, and have ascertained the views of leading gynaecologists on the subject. I have endeavoured to preserve an unbiased frame of mind, and wish to present the conclusions arrived at from my own experience.

Of 210 hysterectomies which I have performed, 165 were total, thirteen subtotal, twelve vaginal, and twenty according to the Wertheim technique for carcinoma of the cervix. Excluding the Wertheim operations, in which the mortality was 10 per cent., there were three deaths among the remainder, or a percentage mortality of 1.58. It will be seen that the total operation is almost exclusively employed, and the mortality in this series is 1.8 per cent.

I do not wish to introduce the question of total *versus* subtotal hysterectomy, except to state that I have now

definitely and exclusively adopted the total technique, and for the following reasons.

1. My mortality rate compares favourably with that of any published series of the subtotal operation.

2. Convalescence has been most uneventful, the average length of stay in hospital being sixteen days.

3. Operative and post-operative complications have been few. In one case the ureter was accidentally cut, and in three others a pelvic haematoma formed owing to inadequate haemostasis of the utero-sacral ligaments. There were two cases of pulmonary embolus, one of which recovered, and two of thrombosis of the femoral vein; there were only two cases in which infection occurred in the abdominal wound. Of the three deaths one was due to pulmonary embolus occurring on the tenth day, one to an ascending urinary infection, and one to a generalized septicaemia originating in the operation site.

4. Marital life subsequent to operation has been extremely satisfactory. Of fifty women who answered my query on this point only one complained of dyspareunia, and all but three said that intercourse was as satisfactory as before, and in a few cases more satisfactory. I therefore conclude that removal of the cervix does not shorten the vagina or cause dyspareunia, and that it does not decrease libido—the latter applies whether the ovaries are removed or not. Nor does it cause prolapse of the vaginal vault. I have examined and questioned many of the patients on this point, and in only one case was there evidence of this complication.

5. With regard to ease and duration of operation there is very little difference between the total and the subtotal technique. When one becomes facile in technique a simple total operation can be done with safety in thirty minutes, and a complicated case should not occupy more than fifty or sixty minutes. As regards haemorrhage, if the blood supply of the vaginal angle and the utero-sacral ligaments is properly controlled, it should be as easy to achieve a bloodless hysterectomy in the one case as in the other. It has been argued that the subtotal operation is safer in the hands of an inexperienced operator. But hysterectomy should only be undertaken by an experienced gynaecologist.

* Read in the Section of Obstetrics at the Annual Meeting of the British Medical Association, Dublin, 1933.

6. In assessing the positive indications for the total operation the experience and views of such men as Spencer,¹ Polak, Weibel, Bumm, Mayo,² and Cuthbert Lockyer,³ who have stressed its value in latter years, must be admitted. They hold that it is definitely dangerous to leave the cervix behind. A large amount of literature has accumulated on the incidence of cancer in the cervical stump. To give only two examples, Polak⁴ reported 256 cases collected in America, and the Mayos saw ninety-nine cases in their own clinic during a period of twenty years.

The existence of a chronic septic focus in the cervix is much more common than is generally believed, and its removal is just as necessary as the ablation of septic tonsils; it is often accompanied by a chronic infected condition of the uterus. The improvement in health, vigour, and outlook on life following the total operation in such cases must be seen to be realized. If the cervix is diseased or unhealthy it must be removed; if healthy it is still a source of danger from infection and malignancy, and as I hold that the total operation is equally safe, I believe that I have better ensured my patients' future safety by adopting this procedure.

INDICATIONS FOR OPERATION

An analysis of the indications for operation in this series shows that there were seventy-five cases of fibroid uterus, twelve of which were complicated by diseased appendages and ten by infected cervixes; thirty-seven cases of chronic infection of the uterus and cervix; and a further fifteen cases of chronic infection of the cervix with or without parametrial involvement which would not yield to conservative measures. Four in the latter group were complicated by severe chronic rheumatism. There were eight cases of chronic pus tubes and disorganized ovaries where it was considered advisable to remove the uterus also, and two cases of pyometra. Carcinoma of the body of the uterus was the indication in eighteen cases, and carcinoma of the cervix in twenty. There were nineteen cases of bleeding uterus, of which adenomyosis accounted for seven and a chronic subinvolution metritis for the remainder. Endometriometra was the indication in one case and malignant ovaries in three cases. There was prolapse associated with chronic infected cervix in ten cases in which vaginal hysterectomy was employed.

Excessive menstrual loss associated with anaemia or with leucorrhoea was the chief symptom in eighty-four cases; ten of these were so exsanguinated as to require blood transfusion before operation. A combination of debility and premature ageing, with persistent ill-health and inability to carry on their customary duties, was complained of in thirty cases. These were distinct from the previous group, and the pathology generally found was a chronically infected or torn hypertrophied cervix with an enlarged subinvolved, and often retroverted, uterus. On subsequent examination these uteri showed evidence of chronic infection in the endometrium and muscular wall, were often extremely soft and congested at operation, and showed fine perimetritic adhesions. They were not undergoing the normal atrophy of the menopause, and such patients were constantly absorbing toxins into their system from this chronic septic focus. As pointed out by FitzGibbon,⁵ these are pre-eminently cases for total hysterectomy, and the extraordinary improvement in health and outlook which takes place in the course of the ensuing year can only be realized by interviewing the patients themselves. Following the questionnaire a number of my patients came personally to express their satisfaction with the result of the operation. I do not believe that any less radical measure would have produced results.

There were three cases of insanity—one confusional, one with suicidal mania and a delusion of cancer of her uterus, and a third with chronic hallucinations. Two of these had septic foci in the cervix and uterus, and following total hysterectomy their mental condition completely cleared up in so short a time as to enable one to attribute it to the operation. In cases of mental disease in women where there are gynaecological symptoms the pelvic organs should be carefully examined, and if uterine sepsis is discovered the uterus should be removed.

In the fibroid series excessive haemorrhage was the chief symptom in forty-five cases, leucorrhoea and bearing down in ten cases, retention of urine in five, and abdominal swelling or pain in fifteen. Irregular haemorrhage before or during the menopause was mostly associated with carcinoma of the cervix or degenerated submucous myomata, while irregular haemorrhage after the menopause led to the diagnosis of carcinoma of the body in thirteen cases. In my series carcinoma of the cervix occurred much earlier in life than carcinoma of the body, and the incidence of the two conditions was practically the same.

With regard to the question of the surgical menopause I have endeavoured to analyse the results following conservation and ablation of the ovaries at various ages. I have accepted hot flushes as the most valuable criterion, and have based my deductions on their occurrence. It is obviously unwise to be dogmatic in such a small series of cases, but the following facts appear to emerge. Of women who have had the uterus removed with conservation of ovarian tissue before 36 years of age, about 50 per cent. reported mild flushes occurring soon afterwards and lasting a short time; none of the remainder suffered symptoms until the age of at least 40. It appears from this that the removal of the uterus may temporarily upset the endocrine balance, but that conservation of ovarian tissue retards the development of the menopause for a number of years. Where the ovaries were sacrificed the flushes occurred in a larger percentage of cases, were much more severe, and the surgical menopause developed sooner. In cases operated on about the menopause age conservation of the ovaries was followed by mild symptoms, while ablation produced severe symptoms in a short time. In cases past the menopause ablation of the ovaries made no difference, while in those over 50 years of age and not past the menopause removal of the uterus, with or without castration, produced more or less severe symptoms in a short time. It thus appears that when hysterectomy has to be performed during the child-bearing period the best results will be obtained by conserving ovarian tissue.

I do not propose to describe the technique of the operation. There are, however, a few essential details to be stressed.

1. The vagina and cervix should be thoroughly disinfected with tincture of iodine or brilliant green prior to operation.

2. If the uterus is malignant or septic the cervix should be stitched and the tubes clamped to prevent the escape of malignant or septic material during operation.

3. Cystic ovaries should be removed, as they are liable to cause trouble afterwards.

4. It is unnecessary to stitch the round or infundibulopelvic ligaments into the angles of the vagina. If the vagina is divided at its junction with the cervix sufficient supporting tissue is preserved. This also provides a longer vagina. Perineorrhaphy should be done when strictly necessary.

5. The vault of the vagina should be closed except in cases of obvious infection, when it is used for drainage.

6. Silk should be used for the pedicles, and it is advisable to avoid including too much tissue, especially at the vaginal angles.

7. If the bladder is pushed well down and one keeps close to the side of the cervix in dividing the tissues there is practically no danger of injuring the ureter.

8. It should be the practice for an assistant to examine the cavity of the uterus before the abdomen is closed, as an undiagnosed cancer of the body may necessitate the removal of further tissue.

Concerning general health following operation 140 queries were sent out; 102 patients replied or called in person. The majority of these reported a marked improvement, and such remarks as "Never felt better," "Able to do my household duties," "Feeling a new woman" were constantly made. The return to a normal blood picture in those who had suffered from excessive haemorrhage was quickly accomplished, and dramatic recoveries were seen in those who had been operated upon for chronic infection.

Total hysterectomy is a safe, sound, and rational procedure when definite indications are present. I am in no sense advocating it as a panacea for the ills of the change of life, but I suggest that it is of immense benefit in that group of cases where chronic uterine sepsis is producing a pathological menopause.

SUMMARY AND CONCLUSIONS

1. A series of 210 hysterectomies is reported.
2. Of these 165 were abdominal total hysterectomies, with a mortality of 1.8 per cent.
3. The chief symptoms complained of, and the indications for operation, are analysed.
4. The results of an inquiry into the general health, marital life subsequent to operation, and the occurrence of the surgical menopause are recorded.
5. Total hysterectomy is advocated as a routine, and the reasons for this are given.
6. Some important points in technique are stressed.

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A CASE OF ACUTE SUPRARENAL HAEMORRHAGE

BY

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The occurrence of haemorrhage into the adrenal glands has long been recognized as a separate clinical entity, but difficulty of diagnosis is emphasized by the fact that most cases are discovered at necropsy; consequently little advance has been made in ascribing to the condition a definite aetiological factor, and none at all in the treatment of the catastrophe. All ages suffer, but infants are most commonly affected. Gunson¹ reports a case in a female aged 6 days; the mother was suffering from puerperal fever and the baby had umbilical sepsis and cellulitis of the arms. Death occurred thirty hours after the onset; post-mortem examination showed haemorrhage into both suprarenal glands, while microscopical examination of a section of the suprarenal, stained by Gram's method, revealed the presence of streptococci. In only a few cases is a presumptive cause so evident as this. Eadie² publishes details of a case of bilateral suprarenal haemorrhage occurring in a boy aged 5 years.

The presence of a definite infective origin for the condition is demonstrated in an article by Lusk and Brumbaugh.³ They record the case of a man, aged 27, working in a lumber camp, who was treated for a felon and later developed follicular tonsillitis, a strain of *Streptococcus haemolyticus* being isolated from the throat. Death followed a brief illness, and necropsy showed haemorrhage into the suprarenal gland, with spontaneous rupture and extensive retroperitoneal haemorrhage. Blood culture revealed the presence of a haemolytic streptococcus. This case was followed by a series of cases of empyema in contacts, and in those so affected a haemolytic streptococcus was isolated from the pus aspirated from the chest in each case. Goodhart and Still⁴ report a case in a male aged 17 months, and in a brief review of the condition point out the inefficacy of treatment even when diagnosis can be made with certainty.

At the other end of the scale is the type of patient of whom Severn writes.⁵ A female, aged 59, unmarried, had been under observation for melancholia and arteriosclerosis with albuminuria, when she suddenly collapsed and was found in a condition of profound asthenia, with a temperature of 102° F.: general atonia and marked abdominal distension were present. Death followed within three hours. Necropsy showed the spleen to be pultaceous and pale, while the suprarenal glands were distended, oval, and red, with no other signs of disease. Careful examination revealed that the haemorrhage had destroyed the medulla and extended to the cortex. No infecting organism was found.

Kemp⁶ reports clinical details of "classical" types—that is, rapidly fatal cases of suprarenal haemorrhage in young children, accompanied by diffuse purpuric cutaneous eruption, pyrexia, and signs of acute infection. An excellent review of the subject is supplied by Rabinowitz,⁷ who distinguishes cases due to: (1) asphyxia, associated with birth; (2) to sepsis (secondary) from streptococci, meningococci, and other bacteria; (3) burns; (4) definite infections such as diphtheria, typhoid fever, scarlet fever, tetanus; (5) trauma; (6) haemorrhagic diathesis; and (7) leukaemia. Two cases are reported in females aged 18 and 17 months respectively. In a subsequent discussion he lays down as criteria for a diagnosis of the condition—acute illness in a healthy child, rapidly followed by purpura and collapse, in the absence of signs pointing to a meningococcal infection.

Kessell⁸ reports a case of acute haemorrhage into both suprarenal glands in a male aged 30; no cause could be ascribed to the condition, although a thorough necropsy was made. Thomson⁹ sums up the essentials of our very inadequate knowledge of the subject as follows:

"Bleeding into one or both of the suprarenals is frequently found in newborn children, as a result of birth injury. It sometimes occurs in children of a few days old, from septicaemia, but the interesting type of the disease is that which occasionally sets in in children during the first year of life, as part of a rapidly fatal illness. The disease sometimes occurs as an epidemic, though there is no other reason to believe it to be infectious. The symptoms set in suddenly with severe abdominal pain, high fever, and sometimes vomiting and diarrhoea. Scattered purpuric spots may appear over the surface of the body. Convulsions are common, and death occurs usually within twenty-four hours, with quick pulse and respiration, and general collapse. No treatment has any effect."

Henderson and Pettigrew¹⁰ bring to notice a case in a female aged 7 months. There was a history of one day being "off colour" and vomiting once. Purpuric spots were present; sudden cyanosis occurred at night, death following almost immediately. Necropsy showed extensive haemorrhages into both suprarenal capsules.

CASE REPORT

A female, aged 17 months, was brought to hospital on account of being "unwell" for one day. About thirty