

## THE FATE OF THE OVARIES AT HYSTERECTOMY

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Nearly all agree that when a hysterectomy or other pelvic operations are performed on women below the age of 45, who are still menstruating, healthy ovarian tissue should be preserved whenever possible. I have always been a strong supporter of such conservatism.<sup>30</sup> Most writers on the subject take the age of 45 as their dividing line and it seems likely that this figure, passed on from one surgeon to another, was originally chosen because it lies midway between 40 and 50 and is the average age of an approaching change of life.

When hysterectomy is performed on women after the age of 45, agreement on the fate of the ovaries is not so universal.

Thirty years ago, with few exceptions, the policy adopted at the great London Hospitals was removal of the ovaries in women requiring hysterectomy after the age of 45. The exact age limit varied with different surgeons, some extending it to 50 and a few putting it as low as 40. But the general consensus of opinion favoured oophorectomy in patients of this group.

There is no doubt that opinion in Britain in those days was influenced by the teaching of Emil Novak, who was regarded as the oracle in gynaecological pathology. In 1951 Novak reaffirmed his view that it is a wise and worthwhile prophylactic procedure to remove the ovaries with the uterus in women at or beyond the menopause, and that retention of the ovaries under such conditions was false conservatism.<sup>31</sup>

Today the subject remains more controversial, favouring perhaps a slight swing in favour of conservatism. Many authorities remain undecided regarding the correct policy to adopt and, consequently, juniors get no definite ruling from their teachers.

It may therefore be of interest to analyse the reasons usually given for ovarian preservation or removal in menopausal women at hysterectomy and to consider if there is any justification for modifying or abandoning Novak's teaching in view of more recent knowledge.

## THE REASONS FOR RETAINING OVARIES

The reasons for retaining the ovaries in women of menopausal age may be summarized under three headings:

- a. To avoid postoperative menopausal symptoms.
- b. To retain any beneficial effect of the postmenopausal ovary.
- c. For psychological reasons.

## A. To Avoid Postoperative Menopausal Symptoms

It is generally agreed that these symptoms are more likely to occur when the ovaries are removed, but it is also well recognized that they occur in a certain proportion of women after hysterectomy even when the ovaries are retained.

Thus Richards<sup>36</sup> reported hot flushes in patients after 27% of hysterectomies, when both ovaries had been conserved, 52% where one ovary had been removed and in 98% where both ovaries were removed. McLaren<sup>29</sup> found flushes occurring in only 46.5% where all ovarian tissue is removed and in 1.5%

where ovarian tissue is left behind.

On the other hand Latto<sup>27</sup> found severe flushes occurring in only 25.5% of patients who had undergone total oophorectomy, and Grogan and Duncan,<sup>17</sup> investigating a group of women under 39 years of age, found disturbing menopausal symptoms in 33% when ovarian tissue was retained and in only 13.5% when both ovaries were removed.

Dodds *et al.*<sup>10</sup> found that 75% of their patients had hot flushes when both ovaries were removed and 83% when one or both ovaries were retained.

These reports reveal a remarkable disparity and it must be concluded that the frequency and severity of climacteric symptoms, following hysterectomy in this age group, are unpredictable and that factors besides abolition or preservation of ovarian tissue are responsible. Few experienced gynaecologists would argue with this statement. What then are the other factors responsible?

The varying psychological reactions of women at this age undoubtedly account for the differing reports. These reactions are unpredictable, but with growing experience, it often becomes possible to differentiate between those who will suffer more, and the stolid, placid woman who will have no symptoms at all. Psychological reaction can be directly associated with such common symptoms as flushing, sweating, headache, depression, insomnia and emotional upsets, with little bearing on the supply of oestrogenic hormone available.

It is well known that the majority of these women react favourably to treatment with oestrogens, but on the other hand it should be remembered that they also react favourably to treatment with many other medicines. In fact some authorities consider it bad practice to use oestrogens if other drugs will suffice, and Jeffcoate<sup>21</sup> considers that they should only be used as a last resort. With the intelligent use of sedatives and tranquilizers most patients can be kept comfortable.

The supply of extragenital oestrogen from the adrenals and diencephalon is another factor about which very little is known.

Experience with breast cancer suggests that the supply of extragenital hormone varies in different women and that the rate of production after ovarian removal is also variable. This could well account for the variable appearance of climacteric symptoms after bilateral oophorectomy and explain why frequently no symptoms at all follow enforced ovariectomy in young women. It may also be postulated that the supply of extragenital oestrogen is controlled by psychological reaction through the hypothalamus and pituitary and that when this reaction is severe the flow is reduced.<sup>26</sup>

The question will now arise: 'Are the menopausal symptoms following ovarian removal worse or more prolonged than those occurring normally at this age?'

If it is accepted that these climacteric symptoms are caused by a lack of circulating ovarian hormone it seems reasonable to surmise that a sudden removal of this hormone causes worse symptoms than a gradual cessation, as happens in the natural menopause, and also that an abrupt stoppage in a woman of the 45-50 age group, when the natural supply is waning, should cause less upset than in younger women. To some extent this is true, but exceptions occur frequently and the surprising absence of unpleasant symptoms in many young women following oophorectomy has already been mentioned. Also, experimental work does not entirely support this surmise.

Turnbull<sup>47</sup> in comparing the symptoms of the natural menopause with those produced following an artificial menopause induced by radiation found that the incidence of flushes was the same in both groups, varying largely with the degree of emotional disturbance present previously, and that there was much less post-menopausal depression in the radium-induced cases than the controls. Loss of libido occurred in 50% of women after the menopause whether it occurred naturally or was induced artificially.



Also, Barr and Charteris<sup>2</sup> in a similar study found no evidence for the belief that menopausal symptoms are unusually severe after a radium-induced menopause or differ greatly from what might be expected naturally.

It is a fair conclusion that the occurrence, severity and duration of the climacteric symptoms in women of menopausal age, after bilateral oophorectomy, are caused mainly by psychological reaction. This conclusion is supported by the bewildering inconsistency in the results of those workers who, by numerous methods, have tried to correlate symptoms with the output of oestrogenic hormone.

### B. To Retain any Beneficial Effect of the Postmenopausal Ovary

In recent years attention has been focused on the relationship of the incidence of cardiovascular disease and osteoporosis, to oestrogen balance in women. If it can be shown that in the postmenopausal woman a certain amount of circulating oestrogen will prevent such disease and that this is supplied by the ovary a good case is established for retaining the ovaries.

Therefore, it is necessary to establish:

1. That circulating oestrogen is normally present in postmenopausal women.
2. That such oestrogen is produced by the ovary.
3. For how long after the menopause oestrogen is normally produced by the ovary.
4. That interruption of this ovarian supply if existent can produce cardiovascular disease and/or osteoporosis.

#### 1. Circulating Oestrogen

There is very little doubt that oestrogen is present in most postmenopausal women. This has been demonstrated clinically by vaginal-cell smears and by laboratory methods estimating urinary oestrogen and pregnanediol. However, it is established that postmenopausal women excrete significantly less oestrogen than before the menopause. Struthers,<sup>42</sup> using the vaginal-smear method, found that nearly 80% of women exhibit a varying amount of postmenopausal oestrogen production.

Geist and Salman,<sup>14</sup> also using the vaginal-smear method, found that postmenopausal women showed wide variations in the degree of oestrogenic activity over varying periods of time.

Brown,<sup>4</sup> using his chemical method of estimating urinary oestrogens, was able to demonstrate small quantities in the urine of postmenopausal women. Also, McBride,<sup>28</sup> estimating oestrogens in the urine of postmenopausal women, found the amounts excreted small and comparable to the output of premenstrual women in the resting phase of the menstrual cycle.

Having established the presence of oestrogens in these women it is important to find out where the hormones are produced.

#### 2. Evidence that such Oestrogen is Produced by the Postmenopausal Ovary

It is difficult to provide evidence that the postmenopausal ovary is indeed responsible for any oestrogen production.

Kellar *et al.*<sup>23</sup> stated that the total mean urinary oestrogen excretion is in the order of 5.8  $\mu\text{g}$ . per 24 hours with a range of 3.1  $\mu\text{g}$ . to 8.1  $\mu\text{g}$ . They state that it is reasonably certain that the source of this oestrogen is the adrenal glands, for their removal leads to a fall in oestrogen excretion to very low levels. Also, Diezfalussy,<sup>9</sup> admitting that the postmenopausal ovary can produce oestrogen, states that the balance of evidence seems to indicate that—from the quantitative point of view—the adrenals are probably much more important.

Again, Struthers<sup>42</sup> found that 43.5% of women showed considerable oestrogenic activity after oophorectomy, only 14% less than after a natural menopause. He states that 'If the

proportion of women showing substantial oestrogenic activity is only 14% less in women without ovaries than in women with ovaries the output of oestrogen by the ovary after the menopause can be only very little at the most. Experimental error is unlikely to account for the whole of this difference, but it could mean that the amount of oestrogen produced from the ovaries in a postmenopausal woman is insignificant.'

McBride,<sup>28</sup> in his researches on urinary output of oestrogens, found the quantity produced comparable in women who had had a natural menopause to those who had had their ovaries removed.

#### 3. For How Long After the Menopause does the Ovary Produce Oestrogen?

Again, it is difficult to distinguish between oestrogen, if any, from the ovary and that from the extragenital source. Most evidence seems to indicate that individual variations are very wide. Diezfalussy<sup>9</sup> expressed the opinion that it depends on the rate of disappearance of the germinative tissue.

If climacteric symptoms can be taken as an indication of ovarian cessation, clinical evidence would indicate that this occurs at, or before, the actual stoppage of menstruation, for only in rare cases do climacteric symptoms first appear a long time after menstruation has ceased. Removal of the ovaries in a woman who has stopped menstruating for any length of time rarely produces any menopausal symptoms at all, unless such symptoms were present before the operation.

In the face of this evidence it seems more likely that extragenital sources, rather than the ovary, are responsible for most of the oestrogen present in women after the menopause.

#### 4. Can Interruption of the Ovarian supply of Oestrogen, if Present, produce Cardiovascular Disease?

It is well known that cardiovascular disease occurs more frequently in women past the reproductive phase of life and it would seem that this disease is, therefore, influenced by oestrogen balance. But this should not influence us to retain menopausal ovaries if they are a potential danger and if it can be shown that these ovaries do *not* affect the oestrogen balance.

Some writers believe that the retained ovary is of benefit. Higano *et al.*<sup>19</sup> compared 102 castrated women with 112 women who had had hysterectomy with preservation of ovarian tissue, all before the age of 45. They found a greater incidence of arteriosclerotic disease in the former group.

On the other hand Ritterbrand *et al.*<sup>37</sup> made a very careful study of 267 women who had undergone oophorectomy and 385 women in whom hysterectomy alone had been performed. As far as possible all extraneous factors which could affect a fair comparison were eliminated and an average follow-up of 17 years for the first group and 14 years for the second group was obtained. No patients were over 45 at the date of the operation. They reached the conclusion that the prevalence of arteriosclerotic heart disease was the same for both groups.

Also, Davis *et al.*<sup>8</sup> state that the onset of the climacteric and diminution of oestrogen production coincides with rapid and progressive increase in the incidence of arteriosclerosis. But in investigating different groups of women they found that the levels of the total lipids, cholesterol and phospholipids in untreated castrates were practically identical with those that had had a spontaneous menopause. Also, the cholesterol:phospholipid ratio was constant in the two groups.

Ten years after the menopause the incidence of abnormal ECGs and hypertension resembled those of untreated cases, regardless of whether the menopause was spontaneous or surgical. The incidence of atrophic vaginal smears was also similar in these two groups.

Novak and Williams,<sup>32</sup> in comparing the results of autopsy examinations on 85 castrated women with suitable control cases, came to the conclusion that castration itself did not initiate a chain of events culminating in degenerative disease and that ablation of the ovaries does not necessarily indicate



invariable depletion of oestrogen.

It would seem, therefore, that nature has determined that women past the reproductive phase of life shall become more liable to cardiovascular degeneration and that one day perhaps all women over 50 will be dosed with oestrogens for the rest of their lives, whether they have ovaries or not.

*Osteoporosis* is another condition for which oestrogen deficiency has been blamed in postmenopausal women. But there is no evidence to prove that castrates are more liable to this condition than normal women of the same age and, moreover, some authorities are not convinced that oestrogen deficiency is an important factor in the aetiology of osteoporosis.<sup>13, 18</sup>

In conclusion, although there is some evidence that the postmenopausal ovary produces oestrogen, the amount is not significant. Most of the postmenopausal oestrogen comes from extragenital sources, such as the adrenal glands or possibly the diencephalon. It seems likely that the adrenals are the main source of supply since these glands are developed from the same coelomic mesothelium as the ovary. Also, it is significant that Fekete *et al.*,<sup>12</sup> Burford and Diddle<sup>5</sup> and Van Wagenen and Catchpool<sup>48</sup> have shown that in mice, where the ovaries are removed at birth, the adrenals undergo nodular hyperplasia and assume the ovarian function. Similar results have been demonstrated in rabbits.<sup>45</sup>

Individual variations in the amount of oestrogen circulating in women at, or just past, the menopause may be explained by variations in the rate of atrophy of the generative tissue in the ovary or in the time taken by the adrenal glands to respond to the stimulus 'to take over.'

In women who have not reached their natural menopause there is evidence to show that the ovary will continue to function for varying periods of time after the uterus is removed and often until the natural menopause is due.<sup>1, 50</sup>

Te Linde and Wharton<sup>44</sup> used monkeys in experiments to support this conclusion. However, in a number of these cases signs of ovarian degeneration, with a premature menopause, follow within a year or two of operation. Interference with ovarian vascular and nervous supply at hysterectomy, precipitating degeneration and cyst formation, may well be the explanation, although this surmise is not quite convincing.<sup>20</sup> With our present knowledge, no good case can be made for preserving the ovary, after a normal menopause, as a protection against degenerative diseases if it is suspected to be a potential danger.

Until it can be shown that the health of the many hundreds of thousands of women all over the world, who have lost both ovaries with the uterus at menopausal age, has suffered in consequence there seems to be no good reason that the threat of arterial degeneration or osteoporosis should affect our policy.

### C. Psychological Reasons

Psychological reasons are sometimes put forward by those who favour retaining the ovary at hysterectomy in women at, or past, the menopausal age. There is no doubt that women at this time of life are often psychologically unbalanced, according to Kushima,<sup>26</sup> resulting from a senescent hypothalamus, which, he maintains, precedes and causes the menopausal changes in the ovary. Kelsey<sup>24</sup> has also stated this belief and expressed surprise that therapy has not advanced beyond ovarian hormone replacement. Both these writers consider that treatment for the common menopausal symptoms should be directed to the *dysfunction of the autonomic nervous system* rather than aimed at the use of persistent hormone therapy.

In some women a hysterectomy, by itself, will be followed by a psychological upset and much has been written in medical literature on this subject.<sup>7</sup> However, my personal experience supports that of Kriger<sup>25</sup> and Dodds *et al.*,<sup>10</sup> who think that serious psychological upsets are not frequent and are usually present before the operation.

It is important to find out if removal of the ovaries, apart from the hysterectomy, carries any added psychological risks. The word castration has a sinister and frightening effect and should certainly be avoided.

Patients show an interesting attitude to the operation. I have found that most women in this age group are unconcerned whether the ovaries are removed or not. Many will say 'For goodness sake remove everything, doctor. I don't want any more trouble'. In recent years some are more inquisitive and want to know the reasons for and against, no doubt because their interest has been stimulated by medical articles in the lay press. A very small minority are 'ovary conscious' and without any scientific grounds have a morbid fear of losing these organs. In these women it is probably wise to avoid oophorectomy unless there is definite ovarian pathology present.

The operation of bilateral orchidectomy is occasionally compared to oophorectomy, mostly by women doctors. On psychological grounds the comparison is inaccurate and somewhat childish, for, firstly, the ovary is contained within the body and its removal causes no disfigurement. Secondly, the testis is a fully functioning organ, sometimes to the age of 70 or more, whereas the ovary is not. Thirdly, it is now known that, genetically, woman is essentially female, with or without her ovaries. Her femininity is 'built-in' and only the presence of a Y-chromosome can make her anything else.

Except in isolated cases there is little support for the theory that ovarian removal can increase any psychological reaction to hysterectomy. This is supported by the follow-up of Dodds *et al.*<sup>10</sup> who found that in 108 cases, where both ovaries were removed, only two complained that their health was worse. These results were no worse than in the group where one or both ovaries were preserved.

### THE REASONS FOR REMOVING THE OVARIES

The reasons for removing the ovaries in menopausal women may be summarized as follows:

- A. To avoid ovarian cancer.
- B. To avoid other pathological ovarian changes.

#### A. To avoid Ovarian Cancer

Ovarian cancer is probably the most dreaded disease in gynaecology because it is usually diagnosed late and is almost always fatal. It is very difficult to obtain a true picture of the incidence of ovarian cancer. Randall and Gerhard,<sup>34</sup> from figures collected in New York State, estimated that during most of a woman's life her chance of developing ovarian cancer is about 1 in 100. But, in spite of the apparently small risk, Taylor<sup>43</sup> pointed out that in 1956 ovarian cancer ranked fifth in the USA as a cause of death from malignant disease in women, and that further statistics collected over the years from 1930 to 1955 indicated a steady increase in deaths from cancer of the ovary. This striking increase, evident after corrections for the advancing age of the population, was occurring while the death rate from cancer of the uterus was falling. It was evident that a similar increase was occurring in Britain over the same period.

Apart from this aspect, it is important to decide if hysterectomy can increase the chances of ovarian cancer developing. Again, the problem is most difficult, for to obtain a true answer all patients must be followed-up for the remainder of their lives, as it is well recognized that the disease may first appear in very old patients.

With our present knowledge, who can say that the pre-hysterectomy ovary is normal in all respects? The vast majority of hysterectomies performed for benign conditions are done for abnormal uterine bleeding and fibroids, both of which conditions may well be associated with abnormal ovarian function, a condition which may increase the chances of subsequent pathological changes and/or malignancy.

Granjon *et al.*<sup>16</sup> demonstrated hyper-oestrogenism in women with fibroids, and Sauramo<sup>38</sup> found ovarian hilus cells present in the majority of 50 cases of uterine myoma, uterine and endometrial hyperplasia, and endometrial cancer.



Wren and Frampton,<sup>52</sup> using the vaginal-smear cornification index as their guide, concluded that normal postmenopausal women secrete oestrogen in low quantities, but probably *not* from the ovary. They also found that oestrogen production was increased in over 50% of 80 cases when an ovarian tumour, mostly a cyst adenoma or adenocarcinoma was present, and they made the suggestion that such tumours tend to develop in ovaries which, though macroscopically normal, produce elevated oestrogen levels.

Many writers consider the post-hysterectomy ovary more liable to cancer, but there is no sound evidence to support this. Others consider that the risk of malignant change is no greater than in the normal woman. Randall<sup>33</sup> estimates that the risk of leaving the ovaries in women of 40 to 45 is that only 8 women in every 1,000 will eventually develop a malignant neoplasm. Reycraft<sup>35</sup> found only 9 cases of ovarian carcinoma occurring after hysterectomy in the Cleveland University hospitals between 1944 and 1953 and estimated the incidence at 0.2%. Schabert<sup>39</sup> states that over 22 years he could trace only one case of ovarian cancer developing after hysterectomy, but he does not give the number of cases treated and admits his follow-up is incomplete. Whitelaw<sup>51</sup> found only one case of carcinoma in 1,219 hysterectomies with ovarian conservation, but he points out that a percentage of these women may still develop carcinoma and that some could have been re-admitted to other hospitals.

The experience of other writers is not so fortunate. Bloom<sup>8</sup> studied 141 cases of primary adenocarcinoma from the Johannesburg General Hospital and found that 15 or 10.6% had previously had a hysterectomy or other pelvic operation performed. In 5 of these cases the ovaries had been conserved when the patient was over 50.

Fagan *et al.*,<sup>11</sup> in reviewing 172 cases of malignant ovarian tumours, found that 13, or 7.55%, had had previous major pelvic surgery, 8 when over 40 and 4 when over 50. Counsellor *et al.*,<sup>6</sup> in 1,500 cases of ovarian cancer, found that 67, or 4.5%, of patients had had a previous hysterectomy. In 80% the interval between the hysterectomy and the discovery of the ovarian carcinoma was 5 years or more. Out of 210 cases of ovarian cancer Golub<sup>15</sup> found 9 instances where a hysterectomy had been performed at the age of 45 or over. Thorp<sup>46</sup> reports 10 cases of ovarian cancer from one hospital between 1945 and 1949, all of whom had had a previous hysterectomy where one or both ovaries were conserved. All, except one patient, were closely approaching the menopause at the time of hysterectomy or had ceased to menstruate. Spreet,<sup>40</sup> studying 260 patients with malignant ovarian tumours, found 26% had had previous operations permitting removal of the ovaries. 52% of these operations were performed in women of 40 or older.

All these authors, influenced no doubt by their investigations, recommend removal of the ovaries at hysterectomy in women over 45. However, we must bear in mind that they do not state the total number of hysterectomies from which their figures were drawn, which might put their case in truer perspective.

Secondary cancer selects the ovary as a favourite site and tumours of the stomach, colon and breast may lodge here. The reason for the frequency of such deposits is not fully understood, but it is probably explained by the anatomy of the vascular and lymphatic connections of the ovary, although Virieux<sup>40</sup> states that 64% in his series developed through transperitoneal implantation. This author, in 100 consecutive autopsies on women with cancer, finds secondary deposits in the ovaries in 37% of which 56.8% could only be detected histologically. The frequency and near fatal prognosis of these metastases has influenced Johansson<sup>22</sup> to recommend prophylactic oophorectomy when a primary growth of the digestive tract is dealt with, and he suggests that the same procedure must be considered in breast cancer.

The possible danger of secondary deposits in the future, from cancers elsewhere in the body cannot, of course, be advocated as a reason for removal of the ovaries at hysterectomy, but, if the balance of other indications for and against it is equal, removing an organ that seems to invite secondary deposits of cancer may be good treatment.

### B. To Avoid other Pathological Ovarian Changes

There is no doubt that the conserved post-hysterectomy ovary can have a certain 'nuisance value'. In certain cases it will cause pain, possibly related to the interference with vascular or nerve connections. The exact aetiology of this pain is difficult to explain, but the symptom often persists until the ovary is removed. In other cases a persistent mass above the vaginal vault may give rise to anxiety on the part of the surgeon, which is not relieved until the mass is explored and removed.

Again, the incidence of these complications in the retained ovary varies, as reported by different writers. Whitelaw<sup>51</sup> records the low figure of only 4 re-admissions for non-malignant ovarian pathology in 1,215 cases; an incidence of 0.33%. Randall<sup>33</sup> estimates that 6 women in every 1,000 will acquire a benign neoplasm. Grogan<sup>17</sup> found that 19 patients out of a group of 391, who had had a hysterectomy with the ovaries preserved, required further laparotomy for an adnexal mass, severe pelvic pain or dyspareunia.

Thorp<sup>46</sup> reports 266 laparotomies at one hospital between 1945 and 1949 for non-malignant pelvic tumours in patients who had previously had hysterectomy. Schabert,<sup>39</sup> in a 10-year follow-up of 169 cases, finds that 46 had reported back with some complaint attributable to ovaries being retained at hysterectomy; 31 were controlled by conservative measures but 15, or 9%, required laparotomy.

Whatever the true incidence of ovarian complications following hysterectomy may be, there is no doubt that a disturbing number of women suffer some form of pain or discomfort which is not encountered when the adnexa are removed, and that a considerable number of these women will need laparotomy and removal of the ovaries before they are symptom free.

### Legal Aspect

Operations on the ovaries are particularly liable to be followed by legal complications. It is most important, therefore, for surgeons to be fully protected before they undertake any surgical treatment of this nature. It is recommended that a written consent is signed by both husband and wife (irrespective of whether they are married in community of property or not) and that this shall embrace and be worded specifically to cover the removal of the ovaries, if the surgeon considers this advisable. There must be an effective consent and permission contained in the signed document. It is not sufficient to state that 'Full permission is given for an operation to be performed on myself'.

Removal of the ovaries and the tubes has come to be regarded by many as part of the operation of hysterectomy in women over 45 and, therefore, special consent for removal of the adnexae is not always obtained. This applies especially in the routine work at a large hospital. It is in my opinion vital for the surgeon to obtain consent for any organ removed. For instance, according to the letter of the law, the appendix cannot be removed at hysterectomy unless consent has been granted. Few women would take legal action for the loss of the appendix unless some complication followed, but the ovaries being gonads seem to command special respect in the layman's mind. Even if they are diseased it is unwise to remove them without the patient's consent. The vast majority of women are reasonable and will trust their surgeon to do what, in his judgment, is necessary. But the occasional patient, perhaps unbalanced by the psychological upsets of the menopause, may be abnormally resentful about the removal of these organs, even though it is in her best interests.

Strachan<sup>41</sup> has suggested that there is no probability of menopausal symptoms supervening if the patient is not told the ovaries have been removed. Although this may well be true it seems a dangerous policy to apply in present times.

Therefore, I would advise that if the ovaries are to be, or MAY BE, removed at operation, pre-operative permission should be obtained, preferably in writing or by other corroborative evidence, which will protect the operator from the occasional 'difficult woman' or her husband. Such consent should be in the form recommended.



## DISCUSSION

In reviewing this evidence most agree that the occurrence and severity of menopausal symptoms, following ovarian removal in women of the 45 - 50 age group, are unpredictable. Equally severe symptoms can occur when the ovaries are not removed. In spite of this, most operators feel that climacteric symptoms are less likely to occur if the ovary is preserved up to the time of the natural cessation of menstruation.

The recent concept of the hypothalamus as the 'head-quarters' of these troubles would seem more than reasonable and will account for those patients who exhibit severe symptoms that cannot be explained by alteration of oestrogen balance alone. There is no doubt that tranquillizing drugs are often more useful than the hormones, and this fact is not generally realized.

The hormonal value of the retained ovary after the menopause is still controversial but, in reviewing the evidence outlined above, one must conclude there is no scientific investigation which has proved that beneficial effects exist, and the legions of women who have lived a normal healthy life without ovaries are proof enough that the organs are in no way essential after the change of life.

Except in special cases, the available evidence shows that psychological reactions to removal of the ovaries are not to be feared and are in no way worse than the reactions occasionally following hysterectomy, when the ovaries are preserved. Where psychological troubles do occur it can nearly always be shown that the potential for these reactions existed before operation.

Therefore, it seems that there is little good reason for retaining the ovary after the menopause. On the other hand there is no indication for the wanton removal of a normal organ unless it can be shown to be a potential danger or even a potential inconvenience. The evidence has shown that the risk of cancer is small, but a feeling exists that it may be on the increase. When it does occur it usually presents as cancer in its most dreadful form. Also, we have seen that the risk of the ovary causing inconvenience, often severe enough to require a second operation, is worthy of consideration.

Therefore, until further scientific proof of the value of the retained postmenopausal ovary comes forth, bilateral oophorectomy would seem to serve the best interests of our patients.

The questions now arise: What are we to teach our students? Is there need to revise the teaching of Emil Novak? The undoubted evidence of ovarian activity following hysterectomy often continuing until the time of the natural menopause seems the only scientific advance that may affect the issue. Some surgeons may regard this as unimportant while others will prefer to delay ovarian removal until menstruation has ceased.

In this respect the relationship of a delayed menopause and cancer of endometrium should be borne in mind, and few would wish to retain ovaries when the faintest risk of this disease exists. Many will think it right to make a time limit for retaining the ovaries even though the patient is still menstruating.

I would submit the following routine, which has been my practice in recent years:

1. In patients under 40 at hysterectomy, or other pelvic operations, the ovaries are removed only if they are macroscopically affected by endometriosis or chronic tubal-ovarian sepsis.
2. In patients over 40 the ovaries are removed with the uterus if the patient has stopped menstruating, but if the patient is still menstruating the ovaries are preserved if they are apparently healthy.
3. In patients of 50 and over the ovaries are removed with the uterus whether menstruation has ceased or not.

No doubt some will consider such a programme errs on the side of conservatism, while a few may consider it too radical. I would suggest that it forms a concrete and reasonable approach to a difficult problem in the light of our present knowledge.

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