

## AN APOLOGIA FOR VAGINAL HYSTERECTOMY

H. B. Atlee, M.D., F.R.C.S., W. G. Colwell, M.D.

and

I. A. Perlin, M.D.

*Department of Obstetrics and Gynæcology,  
Dalhousie University, Halifax, N.S.*

WE prefer, wherever possible, to do a vaginal rather than an abdominal hysterectomy. As a result of this preference, we have extended the indications for this operation far beyond our original expectation, and now take the abdominal route only when adhesions, or previous pelvic operations, or a very large tumour, prevent us from bringing the cervix far enough down to get safely into the pouch of Douglas. The actual size of the tumour does not so much deter us as this inability to get into the pouch, and we have been able to remove vaginally uteri enlarged by fibroids to the size of a six months' pregnancy. We commonly remove uteri the size of a four months' pregnancy. Nor do we hesitate, whenever it is indicated, to remove tubes and ovaries as well as uterus, and the vaginal operation is the method of choice where any repair work is required in addition. Not infrequently we have removed uteri by this route where a previous fixation or suspension had been done, and in cases of chronic salpingo-oöphoritis: although the difficulties of the operation are greatly increased under such conditions. All we ask is that the cervix has its normal mobility so that we can get into the pouch of Douglas without danger to the woman: in only 12 out of 834 cases have we failed to complete the operation vaginally when this was the case.

Recently we have gone back over all the hysterectomies performed by the three members of the gynæcological staff of the Victoria General Hospital, Halifax, from the years 1934 to 1947 inclusive, in an attempt to determine how justified we have been in our preference for the vaginal operation. The results of this study have only confirmed us in our opinion.

Canadian gynæcologists, as a whole, do not seem to have accepted the vaginal in preference to the abdominal hysterectomy, except as an adjunct to the cure of prolapse associated with actual uterine descent, where they do it

as part of the Mayo repair. Naturally, the operation is very much easier to do when the cervix can be pulled out of the vagina, than when it is held up in its usual position by an intact ligamenture. It is also easier to do when the perineum is greatly relaxed. It is our contention, however, that when one has mastered it, the operation is not too hard to do in a woman without prolapse, whether she be multiparous, nulliparous or virginal, always granted that the cervix is sufficiently mobile to allow one to get safely into the pouch of Douglas. And when we use the term "mobile" we refer to normal and not abnormal mobility.

In many ways the vaginal is easier than the abdominal operation. For one thing the operator sits down to it and is spared the awkward and tiring angulation of the body

The vaginal operation does have, from the operator's standpoint, one disadvantage: he requires two assistants for proper retraction. Self-retaining retractors make it possible to do the abdominal operation with only one assistant, but although we have tried all manner of vaginal self-retaining retractors in an attempt to eliminate the extra assistant we have found such retractors to be downright abominations. There is nothing for vaginal retraction so good as retractors in human hands. If the operator cannot obtain two assistants, he had better choose the abdominal route or he may wish he had never been born.

The vaginal operation is also very much easier on the patient. The absence of an abdominal wound leaves her in much greater comfort during the first few postoperative days, and enables

TABLE I.  
AGE OF PATIENT AT OPERATION.

| Operation  | Total | Age group |       |       |       |       |       |       |
|--|-------|-----------|-------|-------|-------|-------|-------|-------|
|  |       | -20       | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70 up |
| Total abd. hyst. alone or c salpingo-oöphorectomy..... | 504   | 3         | 67    | 166   | 181   | 68    | 15    | 4     |
| Subtotal hyst. alone or c salpingo-oöphorectomy.....   | 23    | -         | 2     | 10    | 5     | 5     | 1     | -     |
| Vaginal hyst. alone.....                               | 404   | -         | 18    | 150   | 157   | 62    | 16    | 1     |
| Vag. hyst. c salpingo-oöphorectomy.....                | 144   | -         | 4     | 47    | 47    | 32    | 12    | 2     |
| Vag. hyst. c pelvic floor repair.....                  | 170   | -         | 4     | 41    | 54    | 39    | 25    | 7     |
| Vag. hyst. c perineorrhaphy.....                       | 116   | -         | 6     | 47    | 45    | 15    | 2     | 1     |
| Total.....   | 1,361 | 3         | 101   | 461   | 489   | 221   | 71    | 15    |
| All abdominals.....                                    | 527   | 3         | 69    | 176   | 186   | 73    | 16    | 4     |
| All vaginals.....                                      | 834   | 0         | 32    | 285   | 303   | 148   | 55    | 11    |

necessitated by the Trendelenburg position. For another, there being no closure of an abdominal wound, the operation can be done in less time than the abdominal, even when one commits that unpardonable sin, a subtotal hysterectomy. We think we are slipping if, in an uncomplicated case, we take longer than 20 minutes: whereas the same type of case handled abdominally will take half an hour or more. In a show-off spirit and with the proper case it can be done in less than 10 minutes. And finally, one is spared that struggle with the bowels that dogs the abdominal operation in these days of pentothal and cyclopropane, before curare is given. We suggest that none of the above considerations is unimportant to the gynæcologist who is over forty and should be taking cognizance of ways and means to lift the strain from his ageing cardiovascular system.

her to get up and walk about on the day following operation with much less—indeed often with no—distress. There is also, even when one excludes the more difficult abdominal cases, much less shock with the vaginal operation, with the result that we have felt able to undertake it in old women who are bad surgical risks, in whom we might otherwise have been content with some less serious (and less satisfactory) procedure.

Table I shows that we were able to offer hysterectomy to 66 women over 60 years of age by the vaginal route, but to only 20 in the same age group by the abdominal, and we had no deaths among these 66 women.

The length of stay in hospital is less with the vaginal operation. In the uncomplicated case, a woman who lives in Halifax usually goes home on the eighth day, whereas the same woman operated on abdominally would be kept in hospital at least three days longer. The exception



to this is where some plastic work has to be done in addition to the vaginal hysterectomy, in which cases the stay is approximately the same as that of the abdominal operation.

In these days of rising hospital costs it means a good deal to the average patient—certainly down in our part of Canada—if she can get out of hospital a few days earlier: so does it also if she is able to go back to work earlier. We have no reliable statistics on the latter point, but it is our belief, from what we have been able to observe, that the woman who has had a vaginal hysterectomy can face full work at least a month earlier than the woman who has had an abdominal. Furthermore, the woman who has had a vaginal hysterectomy is able to get about her house and do something to look after herself and her family from the time she goes home: something that the woman who has had the abdominal operation is rarely able to do even with early ambulation.

While in our earlier cases, before we began to use sulfa and penicillin, and before we got our patients up the day after operation, the mor-

bidity in vaginal hysterectomy was higher than in abdominal, such serious complications as bronchitis, pneumonia and paralytic ileus were much less common. But whereas our morbidity in abdominal hysterectomy has remained more or less constant, or with a slight drop, in vaginal hysterectomy it has steadily dropped until it is now much lower than in the abdominal operation. Our criterion of morbidity is a temperature of 100.4° or more occurring after the first 24 hours and lasting 48 hours or more.

It will be seen from Table III that (1) the use of penicillin following abdominal hysterectomy has reduced the morbidity slightly; (2) that the use of sulfa alone following vaginal hysterectomy has reduced the morbidity to a moderate degree; (3) that the use of penicillin alone following vaginal hysterectomy did not cover enough cases to show anything significant; and (4) that the use of sulfa plus penicillin reduced the morbidity greatly in vaginal hysterectomy, but not as much in those cases where some repair work was done in addition as in the hysterectomy alone or combined with salpingo-oöphor-

TABLE II.  
 DAYS IN HOSPITAL BY OPERATION

| Days in hosp.     | Total cases | Operation       |               |                  |                      |                     |                     |
|-------------------|-------------|-----------------|---------------|------------------|----------------------|---------------------|---------------------|
|                   |             | Tot. abd. hyst. | Subtot. hyst. | Vag. hyst. alone | Vag. hyst. with s.o. | Vag. hyst. c repair | Vag. hyst. c perin. |
| -7                | 13          | 5               | 2             | 6                | —                    | —                   | —                   |
| 7-9               | 217         | 11              | 2             | 138              | 43                   | 5                   | 18                  |
| 10-12             | 424         | 130             | 3             | 166              | 59                   | 27                  | 39                  |
| 13-15             | 410         | 215             | 6             | 59               | 24                   | 73                  | 33                  |
| 16-18             | 169         | 77              | 4             | 18               | 11                   | 43                  | 16                  |
| 19-24             | 86          | 44              | 1             | 13               | 5                    | 15                  | 8                   |
| 25+               | 42          | 22              | 5             | 4                | 2                    | 7                   | 2                   |
| Total.....        | 1,361       | 504             | 23            | 404              | 144                  | 170                 | 116                 |
| Average days..... | 13.6        | 15.0            | 21.3          | 11.2             | 11.8                 | 15.4                | 13.3                |

TABLE III.  
 EFFECT OF CHEMOTHERAPY ON POSTOPERATIVE MORBIDITY

|                           | Number of patients and per cent morbidity |      |        |      |            |      |                 |      |
|---------------------------|---|------|--------|------|------------|------|-----------------|------|
|                           | Before sulph.                             |      | Sulpha |      | Penicillin |      | Sulph. and Pen. |      |
|                           | No.                                       | %    | No.    | %    | No.        | %    | No.             | %    |
| Total abd. hyst.....      | 358                                       | 26.2 | —      | —    | 146        | 18.5 | —               | —    |
| Subtotal hyst.....        | 23  | 30.4 | —      | —    | —          | —    | —               | —    |
| Vag. hyst. alone.....     | 175                                       | 34.8 | 99     | 23.2 | 23         | 17.4 | 107             | 3.7  |
| Vag. hyst. c. s.o.....    | 49  | 46.9 | 38     | 28.9 | 10         | 20.0 | 47              | 6.4  |
| Vag. hyst. c. repair..... | 83  | 36.1 | 45     | 26.7 | —          | —    | 42              | 19.0 |
| Vag. hyst. c. perin.....  | 33  | 48.5 | 22     | 22.7 | 8          | 37.5 | 53              | 13.2 |
| Total.....                | 721                                       | 32.0 | 204    | 25.0 | 187        | 19.2 | 249             | 8.8  |
| All abd. hyst.....        | 381                                       | 26.5 | —      | —    | 146        | 18.5 | —               | —    |
| All vag. hyst.....        | 340                                       | 38.2 | 204    | 25.0 | 41         | 22.0 | 249             | 8.8  |



ectomy. Our method of using sulfa and penicillin is as follows: before closing off the vaginal vault we inject into the peritoneal cavity about three ounces of a sulfa emulsion, and we give 50,000 units of penicillin every three hours post-operatively for 48 hours. We used to leave a cigarette drain in the pouch of Douglas for 24 hours in our vaginal hysterectomies to take care of any bloody ooze, but discontinued its use following a death from intestinal obstruction where the drain had been the focus around which the obstruction occurred.

We must confess to a rather large number of cases in which there was no demonstrable cause for the morbidity. For the most part this unknown group had no other symptom except the fever, and most of them felt perfectly well. Of the known causes two were more common in vaginal than abdominal hysterectomy— infections of the vaginal vault and pouch of

sult of this safety we have adopted the policy that every woman who comes to us bleeding, after the menopause has been established, has her uterus removed without further ado (unless she has carcinoma of the cervix). What is the alternative to this in women bleeding after the menopause? Curette to make a diagnosis, and then radium and/or x-rays, or abdominal hysterectomy; each of which procedure carries its operative risk. One of us saw four cases of carcinoma of the body become inoperable in whom a diagnostic curettage had been carried out in another hospital. The curettings had been examined microscopically by a pathologist who was a specialist in gynecological pathology, and thought to be benign. Yet all these women continued to bleed after curettage and eventually returned to hospital hopelessly advanced. Once we mastered the vaginal operation we gave up such fiddling while Rome

TABLE IV.  
COMMONEST CAUSES OF MORBIDITY.

| Cause of morbidity                      | All abd. hyst. |            | All vag. hyst. |            |
|---|----------------|------------|----------------|------------|
|   | No.            | % distrib. | No.            | % distrib. |
| Abd. wound infection.....               | 30             | 23.4       |                |            |
| Infection of vag. vault or P. of D..... | 17             | 13.3       | 53             | 25.0       |
| Cystitis.....                           | 3              | 2.3        | 20             | 9.4        |
| Other known causes.....                 | 30             | 23.4       | 36             | 17.0       |
| Unknown causes.....                     | 48             | 37.5       | 103            | 48.6       |
| Total.....                              | 128            | 100.0      | 212            | 100.0      |

Douglas (pelvic peritonitis), and cystitis. The infection of the vault and pouch appeared to be due most commonly to a collection of blood and when this drained away the temperature dropped immediately. The higher incidence of cystitis occurred in those cases where a repair was done in addition to the hysterectomy, and in which we left an indwelling catheter. This complication has practically disappeared since we have been giving  $7\frac{1}{2}$  grains of sulfadiazine every four hours for as long as the catheter is in and 24 hours after it is taken out. Phlebotrombosis occurred as commonly in the abdominal as the vaginal cases, and its incidence does not seem to have been influenced either by early ambulation or sulfa and penicillin.

As has already been stated, one of the great advantages of vaginal hysterectomy is its safety, as reference to Table VI will show. We feel able to undertake this operation in cases where the patient's general condition would deter us from the abdominal route. As a re-

burned. We do the operation in every woman who bleeds from the cavity of the uterus after the menopause, and we teach our students that this is a good thing to do, with the result that we are getting post-menopausal bleeders sent in to us much earlier than used to be the case.

We do the operation as a diagnostic as well as a therapeutic measure. When we have the uterus out and opened we can see with our eyes the polypoidal growth that the curette might have missed, and can send the whole endometrial cavity to the pathologist. If there is definite malignancy or a suspicious polypoidal growth or ulceration, we remove the tubes and ovaries also, and this additional procedure has not added to our mortality. We believe that the mortality of the operation in our hands is no higher than that of a diagnostic curettage in this type of case. If anyone with any experience with the curette in the uteri of old women will search his memory he will recall that this apparently simple operation car-



ries its own very definite mortality, as does the insertion of radium into such a uterine cavity; and if one does the diagnostic curettage today and inserts the radium next week the risk is doubled.

What about the nulliparous or virginal postmenopausal bleeder whose vagina has been shrunken and narrowed by the ravages of Anno Domini? We find such shrinkage very seldom so extensive that an episiotomy will not overcome it; and there is an unexpected amount of room in the upper vagina, even in ancient virgins.

Another advantage of the vaginal hysterectomy arising out of its safety is that we can offer it to those cases of pregnancy where an interruption of the pregnancy and subsequent sterilization is felt to be necessary owing to the patient's general condition. I know of no way of dealing with the Fallopian tube that will guarantee against a future pregnancy: no matter how carefully the tube is tied, or what suture material is used, there is always the possibility of the suture devitalizing the tube wall in such a way that the mucosa of the uterine end becomes exposed and canalized. Furthermore, if one is faced with a patient already pregnant who requires a therapeutic abortion as well as sterilization, one has first to empty the uterus (an operation with a considerable risk) and then later open the abdomen to tie off the tubes; in short, two operations and two anaesthetics, and two stays in hospital. The alternative to the above is some form of hysterectomy which does everything at one sitting and produces a certain sterilization, and here the vaginal hysterectomy offers not only greater safety but quicker rehabilitation. We have done this operation up to the fourth month, and it is surprisingly easy to do in such cases if, half-way through, one empties the uterus of its contents. We have had no mortality and no more than the average morbidity in the cases we have handled in this manner: and we began to use this procedure because of a fatality that arose as a result of a therapeutic abortion.

It will be noted that of the 527 cases of abdominal hysterectomy only 23 were subtotal. We apologize even for these, for we hold that it is just as silly to remove the body of the uterus and leave the cervix behind as it is to remove gallstones and leave the gallbladder behind, or

remove a cancerous breast and leave the axillary gland behind. Where we have done the subtotal it was because the difficulty of the operation, and the seriousness of the patient's condition towards its end, forced us to desist from completing a proper job. They were all desperate cases and we had to be content with half a loaf. We are glad to note that the gynaecological world is gradually moving towards the position we have held for 25 years regarding total hysterectomy. At a Congress of the American College of Surgeons 12 years or more ago, we heard an outstanding gynaecologist declare that he never did a total hysterectomy except for cancer of the corpus, contenting himself with a subtotal plus cauterization of the cervical canal. He gave several reasons why the cervix should not be removed: it left a more normal vaginal vault; there was less chance of the vault prolapsing; coitus was more enjoyable. Last year he had an article in the journals recanting all this: he is now a total hysterectomizer. For 25 years we have listened to all the arguments against total hysterectomy, and waited for the Cassandra-like predictions to be visited upon our cases. They never have. We now believe that these predictions were bugaboos used by the frightened to scare the timid. On the other hand we are constantly having to remove stumps of cervixes — or treat them for carcinoma — which others have left behind. Subtotal hysterectomy may be a safer operation for the casual operator, but should the casual operator be doing hysterectomies? It should surely not be a gynaecologist's operation.

In an operation like vaginal hysterectomy, where one is not able always to see as clearly as in the abdominal what one is doing, the question naturally arises: Is damage to the bladder, ureter or bowel more frequent? We damaged the ureter once in the vaginal and once in the abdominal series, and in both series we inadvertently opened the bladder three times. In no case, to our knowledge, did we damage the bowel in the vaginal operation, but we had one faecal fistula following an abdominal. In both cases of damage to the ureter the error was not in cutting it but in catching it in a clamp in trying to regain a slipped bleeding point: we were lucky enough to have both these fistulae heal spontaneously. In all cases where we opened the bladder—and in one vaginal case we opened it widely thinking we were in the ab-



dominal cavity—we finally recognized our sin and repaired the opening: but we did not allow the accident to prevent us from completing the operation. The accident occurred in both abdominal and vaginal operations while we were stripping the bladder away from the cervix—some bladders seem to tear like putty. In vaginal hysterectomy it is much easier (and one can make a better job of it) to repair the hole in the bladder after the uterus has been removed: there is much more room, much better visualization, and the walls of the bladder come together better. In so far as we are concerned, then, bladder, ureter and bowel damage has been no more common in the vaginal than in the abdominal operation; nevertheless, we must confess that we are much more conscious of the possibility of doing such damage during a vaginal operation. Perhaps that consciousness makes us more careful.

There are obvious limits to the scope of the vaginal operation, and we recognize four: (1) where there have been previous pelvic operations via the abdomen with the likelihood of many adhesions, and especially where a suspension or fixation has been done. (2) Where we are clearly dealing with a case of chronic salpingo-oöphoritis, or any other non-mobile pelvic mass such as advanced endometriosis. (3) Fibromyomata that enlarge the uterus beyond the size of a five months' pregnancy; and most important (4) any case in which the cervix has not, for some reason (including any of the above) its normal downward excursion. We have operated on cases in which all the first three limitations were present, but when number four is present we fly immediately to the abdomen, having learned this caution through blood, sweat and tears. We also have noted the following: (1) in women with long vaginas the operation may be surprisingly difficult, and (2) an episiotomy may turn a case that is causing great difficulty into one of surprising ease.

But if there are limits to the vaginal operation so are there to the abdominal. Quite a number of our vaginal operations were done on women in such poor general condition that we would not have risked the abdominal. Nevertheless, we must admit that the limitations to the vaginal are greater than to the abdominal, and that some hysterectomies are impossible except by the abdominal route. The really formidable abdominal operations could not have been done

vaginally. We must further confess that in five cases where we started to do the operation vaginally we had to open the abdomen to complete the removal of the uterus, and in seven cases where we had been able to get the uterus out vaginally we had to open the abdomen to catch an elusive bleeding point. But the extent to which we have been able to replace the abdominal by the vaginal operation is shown in the fact that in the last 15 years in one hospital we have done 834 vaginal as against 527 abdominal hysterectomies.

It will be noted from Table V that we did about as many vaginal as abdominal hysterect-

TABLE V.  
COMMONEST PATHOLOGICAL CONDITIONS  
FOUND AT OPERATION.

| Pathological condition   | Total | Operation      |                |
|--------------------------|-------|----------------|----------------|
|                          |       | All abd. hyst. | All vag. hyst. |
| Fibroids.....            | 419   | 223            | 196            |
| Benign uterine bleeding  | 558   | 81             | 477            |
| Adenomatous polypus....  | 48    | —              | 48             |
| Chr. salpingo-oöphoritis | 110   | 88             | 22             |
| Endometriosis.....       | 31    | 31             | —              |
| Cancer corporis.....     | 44    | 26             | 18             |
| Other conditions.....    | 151   | 78             | 73             |
| Total.....               | 1,361 | 527            | 834            |

tomies for fibroids. Generally speaking, however, the fibroids were small in the vaginal cases, not enlarging the uterus as a rule beyond the size of four months' pregnancy. In the so-called benign uterine bleeding group, however, we did six vaginals to one abdominal, and most of those abdominals were done early in the series before we had thoroughly taught ourselves the vaginal operation. In effect, we never open the abdomen now to take out a mobile uterus smaller than a three months' pregnancy. It will be noted that we did 26 abdominal as opposed to 18 vaginal hysterectomies for carcinoma of the corpus. Once again the abdominals were done early in our series, and we now attempt the vaginal operation in all cases of cancer of the body.

We did vaginal hysterectomy in association with some form of repair in 286 cases. As a rule we do not remove the uterus where prolapse is present unless there is some indication other than the prolapse for its removal. We still feel that, in women from whom age has subtracted the joys of coitus, some form of LeFort's colpectomy seems a safer and as satisfactory an operation; while for those who wish to continue their



matrimonial exercises the Fothergill operation produces a more joyous vagina. However, we are trying to preserve an open mind in this matter, to the extent that in nine cases, all elderly women, we have removed the uterus, without indication on its part, in the course of a repair.

TABLE VI.  
DEATHS FOLLOWING  
ABDOMINAL AND VAGINAL OPERATIONS

| Operation                | No. of operations | No. of deaths | Fatality rate percent |
|--------------------------|-------------------|---------------|-----------------------|
| Tot. abd. hyst.....      | 504               | 10            | 2.0                   |
| Subtotal hyst.....       | 23                | 2             | 8.7                   |
| Vag. hyst. alone.....    | 404               | 3             | 0.7                   |
| Vag. hyst. with s.o. . . | 144               | —             | —                     |
| Vag. hyst. with repair   | 170               | 1             | 0.6                   |
| Vag. hyst. with perin.   | 116               | —             | —                     |
| Total.....               | 1,361             | 16            | 1.2                   |
| All abdominal hyst..     | 527               | 12            | 2.3                   |
| All vaginal hyst.....    | 834               | 4             | 0.5                   |

If subtotal hysterectomies are excluded, in which the high death rate was due to the great difficulties encountered, it will be seen that the mortality in abdominal hysterectomies was about four times that in vaginal. Our statisticians tell us that it is not significant, nevertheless it strikes us as odd, that the mortality in 404 vaginal hysterectomies alone, was three times that in the 430 cases in which the tubes and ovaries were removed or some repair work done in addition.

Table VII reveals the somewhat astonishing fact that, despite the introduction of sulfa, penicillin and early ambulation in the handling of the second group, and despite the extended use

TABLE VII.  
CASE FATALITIES BY YEARS.

| Years     | All abdominal hyst. |        |               | All vaginal hyst. |        |               |
|-----------|---------------------|--------|---------------|-------------------|--------|---------------|
|           | Ops.                | Deaths | Fatality rate | Ops.              | Deaths | Fatality rate |
| 1934-41   | 249                 | 7      | 2.8           | 349               | 2      | 0.5           |
| 1941-47   | 278                 | 5      | 1.8           | 485               | 2      | 0.4           |
| Total.... | 527                 | 12     | 2.3           | 834               | 4      | 0.5           |

of blood transfusions and improvements in operative technique, the mortality has remained much the same over the years in both the abdominal and the vaginal cases.

It will be seen from Table VIII that 50% of the total deaths from hysterectomy were in patients who either had fibroids alone, or fibroids

associated with chronic salpingo-oöphoritis. We are not inclined to look upon fibroids as a particularly dangerous entity, or as increasing

TABLE VIII.  
DEATHS ACCORDING  
TO PATHOLOGICAL CONDITIONS PRESENT.

| Pathological condition  | Total deaths | Operation      |                |
|-------------------------|--------------|----------------|----------------|
|                         |              | All abd. hyst. | All vag. hyst. |
| Fibroids.....           | 6            | 3              | 3              |
| Fibroids plus.....      | 2            | 1              | 1              |
| Chr. salp.-oöph.....    | 5            | 5              | —              |
| Benign. uter. bldg..... | 1            | 1              | —              |
| Ovarian tumour.....     | 1            | 1              | —              |
| Total.....              | 16           | 12             | 4              |

the gravity of the prognosis, unless they are associated with very serious and difficult adhesions, yet in all but one of the cases in which fibroids were the indication for the operation that resulted in death, there was nothing particularly formidable about the operation. Chronic salpingo-oöphoritis, the second commonest pathological condition among the deaths is fortunately very much less common than it was with us in the wicked '30's.

Of the 12 abdominal hysterectomy deaths 4 were due to peritonitis, 3 to pulmonary embolism, 3 to shock and myocardial failure, one to secondary hæmorrhage, and one to intestinal obstruction (the bowel was found gangrenous at the hysterectomy). Of the 4 vaginal hysterectomy deaths 2 were due to peritonitis, one to paralytic ileus and congestive heart failure, and one to pulmonary embolism. The two peritonitis deaths in the vaginal cases occurred before we began using penicillin and sulfa, but the last two deaths occurred in 1947.

The vaginal hysterectomy we do is the one devised by Heaney of Chicago, to which we have added certain slight modifications of our own. If the illustrations in Te Linde's *Operative Gynecology* are followed, the description of the operation which we now append will be read with greater clarity. We feel that, in order to do the operation satisfactorily and with reasonable ease, it is necessary to make sure of the following:

1. An assistant on each side to give proper retraction. Without both of these proper retraction, which means proper visualization well up into the pelvis, is impossible.
2. Certain instruments. The great boon that we personally owe to Heaney is the instru-



ments he has devised for this operation. Until we began to use these we were unable to get good visualization and our clamps were constantly slipping off the pedicles. In addition to the usual set of vaginal instruments, we feel that the following are essential: (a) At least four Heaney clamps—the best hysterectomy clamps we have ever used—which seem never to slip or to wear out. (b) Two Heaney-Simon retractors which we find indispensable for a clear view up into the pelvis after the uterus has been removed so that we can inspect all the pedicles. (c) A Bland or Swift-Joly needle-holder, which enables us to use the needle as a sort of hook, making the transfixion of the pedicles very much easier in the narrow space available. (d) One pair of pickup forceps with long blades. (e) Three Richardson appendectomy retractors for the vaginal walls. (f) A pair of strong, long-handled scissors.

3. A properly placed light. This may seem a ridiculous stipulation, since it should be a *sine qua non*, yet if nurses are left to themselves they invariably place the light too high, so that while it shines into the vagina it does not shine up into the pelvis and so precludes good visualization of the pedicles. The spotlight should be just above the operator's left shoulder, and may have to be changed to his right if there is a bleeding point in the pedicles on the patient's right.

Despite our long experience with this operation we do not now attempt it without the facilities described above. We find that we can preserve our sterile technique better by using a special vaginal sheet, which has a large attached flap which we bring over our lap and fasten with clips at each side of our waist: this keeps our knees out of the wound and the instruments out of our boots.

With a weighted speculum in the vagina, one Richardson retractor holding the bladder up, and one on each side holding the vaginal side walls apart, the cervix is caught with a volselum on the anterior and another on the posterior lip. The cervix is pulled down as far as it will come, and a circular incision, running slightly up at each side is made just where the vaginal portion of the cervix becomes vaginal wall. If the incision is made too high the vagina will be shortened, but if it is made too low, the plane of cleavage which makes easy entrance to the utero-vesical space in

front, and the pouch of Douglas behind, will be missed, thus greatly hindering the further conduct of the operation.

Having made this incision, the next step is to cut boldly with the scissors through the so-called pubo-cervical ligament, for unless this is done one is likely to dissect upwards at the expense of the uterine wall and miss the peritoneal reflection. But if this ligament is cut through one finds oneself in that easily dissectable space between cervix and bladder that consists of reticular tissue only. The bladder is now pushed up with the fingers or with sharp dissection to the level of the peritoneal reflection. If this reflection can be clearly seen it is opened with the scissors: if not it is left until later. Sometimes the bladder is very thin and almost friable and in pushing it up with the fingers may be opened. The accident should not deter one from continuing with the operation. The hole can be closed at once or, if this is not easy, left until the uterus has been removed when both visualization and mobilization are very much better. In such cases a catheter is left in for 12 days and the patient given sulfadiazine  $7\frac{1}{2}$  grains every three hours while it is in.

Having freed the bladder in front the cervix is now pulled up and forward and the cut posterior vaginal cuff pushed backwards with a "swab" on a sponge-holder. As a rule this causes the peritoneum of the pouch of Douglas to bulge into the wound. It is grasped with tooth forceps and opened with long scissors. Usually a small amount of clear fluid escapes and in difficult cases this tells us we are in the pouch. If the peritoneum does not bulge into the wound the tendency is to start dissecting upwards too far forwards so that one keeps pushing peritoneum off the back of the uterus. To avoid this it is necessary to cut in a backward direction. While doing this one keeps wondering if one will cut into the rectum, but we have never had this happen.

With the pouch of Douglas opened the scissors are thrust into it, their blades opened widely and withdrawn: this makes a wide opening into the pouch into which is thrust one of the long-bladed Heaney-Simon retractors. A wet strip, with a tape to which an artery forceps is attached, is then pushed with uterine dressing forceps up into the pelvis and acts as a mop for spilled blood. We find that un-



less we get into the pouch in the manner just described the difficulties of the operation become greatly increased: we therefore make every effort to do so.

The second assistant now puts one Richardson retractor up under the bladder to elevate it off the cervix and the lateral ligaments, and uses another to retract the side wall of the vagina. The first assistant pulls the cervix to the other side. The operator now puts his forefinger up behind and to the left of the cervix and pulls down on the combined uterosacral and cardinal ligament (which seems to us to be all the same structure). The blades of a Heaney hysterectomy clamp are widely opened, pushed up over the ligamentous structure that is being hooked down by the forefinger, and clamped tightly. There is a tendency to clamp too much tissue in this manoeuvre: as a result the uterine, or a large branch of it, may be caught in the upper end of the bite which will slip out while the pedicle is being tied. It is therefore better to catch only ligamentous tissue in this first clamping.

One now cuts the ligament with scissors as close to the cervix as possible, so as to have a thick pedicle, and we stop cutting just before we reach the tip of the clamp since, if we cut further, we are likely to snip a vessel and so get bothersome and obscuring hæmorrhage. For ligature material we use No. 2 chromic catgut throughout on a hernia rather than a cervix needle, since the latter type of needle, with its sharp edge, may cut a vessel in the pedicles. We use this needle on the Bland or Swift-Joly needle-holder, using the needle as a hook, and find that it greatly lessens the difficulty of manipulating the needle in what is sometimes a very small space. The needle is inserted as a rule from before backward and as close to the cervix as possible. After the ligature is tied, we transfix the pedicle with another suture just below the tie and without tying it clip its two ends with an artery forceps, thus enabling us to pull the pedicle down easily. We used to employ the original tie for this purpose, leaving it long, but it slipped on us so often causing hæmorrhage that we made the modification just described, cutting the tie as soon as the pull-down thread has been inserted. It is an advantage in manipulating the needle in all transfixions if the first assistant is armed with

an ordinary needle driver so that he can grasp the end of the needle, after it has been pushed through the pedicle, and pull it through. If the operator, after pushing the needle through the pedicle, lets go of it with his needle-driver and then tries to pick up the point himself, he may find that it has twisted away out of sight and may have to reinsert it again.

Having ligatured the left uterosacral-cardinal ligament and left a pull-down thread on its pedicle, we now shift to the other side. The second assistant holds the top retractor and the volsella, and pulls the cervix down and to the left, while the first assistant inserts a Richardson retractor on his side of the vaginal wall. The operator then proceeds to clamp the right uterosacral-cardinal ligament on the right side, to ligature it and to insert a pull-down thread into its pedicle. For mopping purposes we use gauze swabs on long sponge forceps, and these are also useful for pushing bowel and appendices epiploicæ away from the needle-point or clamp.

We now proceed to clamp the right uterine vessels. Their position is best established by putting the forefinger up behind the broad ligament and hooking it down while the Heaney clamp is applied. It is surprising to note how much closer these vessels appear to run to the anterior than the posterior wall of the uterus, and when the clamp is applied its tip points forwards as well as inwards and upwards. Here again the needle carrying the suture is placed as close to the uterine wall as possible. While we generally push the needle from before backwards in doing this, we frequently push it from behind forwards, whichever appears to be the easiest. After we tie the uterines we cut the ligature at once. We used to leave it long so that we could pull the pedicle down, but after it had pulled off a couple of times we learned better.

The assistants now change instruments and the uterine vessels on the left side are clamped and tied in the same way. This leaves the uterus, except when it is considerably enlarged by pregnancy or fibroids, attached only by the upper part of the broad ligaments on each side. In order to get the clamps on these readily, the fundus of the uterus is delivered through the opening in the pouch of Douglas, by pulling vertically upwards on the cervix and hooking a forefinger behind the fundus. If the uterus



will not come with this manœuvre, we use two claw retractors with sharp claws, with which we climb up the posterior uterine wall, pulling it down as we climb. If it still refuses to deliver, we start morcelling it with the scissors. Often it is enough just to cut the cervix away, but if the uterus is greatly enlarged by fibroids, the morcelling process is continued, requiring sometimes a good deal of patience, until delivery of the remnant of the uterus can be effected. As a preliminary to morcellation, we always enter the peritoneum anteriorly and get a Heaney-Simon retractor up under the bladder, partly to protect the latter and partly to aid visualization.

When the body of the uterus has been delivered the broad ligament is clamped with two Heaney forceps—their points directed towards each other—on each side, and the uterus cut away with scissors, leaving a good-sized pedicle. This pedicle is transfixed, tied, and the tie left long with an artery on it, and we find it helps in differentiation if we use a different type of artery forceps on this ligature than we did on the pulldown thread on the uterosacral-cardinal ligament.

But let us return for a moment to the ordinary-sized uterus whose fundus we were able to deliver through the pouch of Douglas without morcellation. While in some cases we have already opened the peritoneal reflection between bladder and anterior uterine wall, in most cases we have not. In the latter event we thrust a forefinger up behind the uterus and press down with it against the anterior peritoneal reflection. If some bladder tissue still remains attached to the cervix between us and the peritoneum, we can now push it away. We then catch up the peritoneum with a tooth forceps or Allis and incise it, opening it widely. The Heaney clamps are now applied to the broad ligaments on each side and the uterus cut away.

What now faces us in the uterus-denuded pelvis? We have the broad ligament with the Fallopian tubes caught in one ligature on each side and this ligature, left long, has an artery forceps on it. Below this we have the pedicle of the uterine vessels whose ligature was cut short. Below this again we have the pedicle of the uterosacral-cardinal ligament, with a pulldown thread through it just this side of the tie which was cut short, and the pulldown thread has an artery forceps on it different from the one of the pedicle of the broad ligament. If the

uterus was very large there may be one or two additional pedicles on each side.

We now proceed to inspect all these pedicles, by placing a Richardson retractor on each vaginal side wall, a Heaney-Simon under the bladder and another in front of the rectum. By pulling on all these and perhaps pushing bowel or omentum up out of the way with a swab on a sponge-holder, the entire pedicle area can be readily viewed and any bleeding point clearly seen and dealt with. There is frequently—indeed it occurs in the majority of cases—considerable oozing from the posterior vaginal cuff. This requires no special attention since it is controlled by the final running suture which closes the vaginal vault, although occasionally earlier in the operation we may have been forced to secure and tie a spurter.

By pulling down the broad ligament pedicle we can inspect the tubes and ovaries. The removal of these is a much more difficult undertaking with the vaginal than with the abdominal operation. In a considerable number of cases they lie high up at the side of the pelvis and the infundibulo-pelvic fold will not stretch. In these cases getting the Heaney clamp on the fold above the ovary may tax one's ingenuity. We always do this under direct vision, using the Heaney-Simon retractor to hold the bladder forward and pushing the bowel up out of the way with the swab on the sponge-holder. Despite the added difficulty of removing the tubes and ovaries, it does not seem to increase the mortality or morbidity of the operation. On one or two occasions, after removal of the uterus, we have found ourselves faced with an ovarian cyst too large to be delivered without puncturing it. In such cases, rather than risk a spill of potentially malignant cells in the peritoneal cavity, we have completed the operation in the manner to be described and then gone into the abdomen after the cyst.

The operation is completed in this fashion. A cervix needle, threaded with the No. 2 chromic catgut that we have been using throughout, is pushed through the anterior vaginal mucosa at one of the outer angles of the wound. We will call this suture the tiedown stitch. In order to get good visualization for this, the bladder is pulled up with a Richardson retractor. The needle is now pushed through the peritoneum as close to the broad ligament pedicle as possible, and to make this easy the pedicle is drawn



down by pulling on its ligature which was previously left long with an artery forceps on it. Sometimes the peritoneum retracts fairly far up into the pelvis and has to be sought for. We now use two long Allis forceps for this purpose and with them climb our way step by step up the raw surface of the bladder until we reach the peritoneum.

The needle now goes through the pedicle of the broad ligament on *this* side of the ligature on it, so that when it is pulled on there is no danger of pulling off the ligature. When this has been done the ligature is cut. The pedicle of the uterine vessels is now picked up with the long-bladed pickup forceps and the needle pushed through it in the same fashion. Sometimes, especially in older women, this pedicle is small and friable and the needle pulls out: if it does this we let the pedicle go rather than persist in tearing it to such an extent that its ligature may slip. We now pull down on the pulldown thread that runs through the stump of the uterosacral-cardinal ligaments and catch this pedicle in our stitch. When we have done so we pull out the pulldown thread and discard it. We now pick up the posterior peritoneum, put the needle through it and then through the posterior vaginal mucosa, and we have a suture which, when tied, brings all the pedicles down into the angle of the vaginal wound. As a general rule, after we have got the needle through the stump of the broad ligament, we remove the Richardson retractor which was holding the bladder up and insert Heaney-Simon in its place. The long blade of this retractor goes so much farther into the pelvis that when it is pulled on, complete visualization of all the pedicle area is obtained, greatly facilitating the insertion of the rest of the tiedown stitch we have just described.

We do not tie this tiedown stitch immediately but catch its long ends in a forceps and leave them hanging while we inspect the pedicle area on the other side. To tie this stitch immediately means to contract the circle of the wound to such an extent that visualization of the pedicles on the other side is not easy and, if there is oozing or a bleeding point it makes the securing of these difficult. If there is any bleeding point in the pedicles it is caught by a long tonsil artery forceps and tied. If there is oozing we oversee the area with No. 1 plain catgut on a small non-cutting needle, which we insert

superficially in the pedicle area to avoid the ureter.

When both sides have been secured in the tiedown stitches, a Heaney-Simon retractor is inserted fore and aft and the pedicle areas again inspected. If there is no bleeding except the oozing from the posterior cuff, we pull out the tape-pad and tie the tiedown stitches at the angles of the wound. We now thread a long end of one of these tiedown stitches on our needle again and use it to close the rest of the wound, going from before backwards through vaginal mucosa, bladder peritoneum, peritoneum of pouch of Douglas, and posterior vaginal mucosa. This stitch when pulled tight will finally stop the oozing in the posterior cuff. Before tying it, a Heaney clamp is thrust into the pelvis and its blades opened. We then push up a ten inch length of inch wide gauze on a uterine dressing forceps to mop up any loose blood that remains in the pelvis and when the latter is dry we squirt through the same hole into the pelvis about three ounces of a sulfa emulsion and finish the job by tying the stitch we have just been running across the top of the vagina to one of the ends of the already tied tiedown stitch on the other side.

If there is still some oozing from the posterior cuff we may pack the vagina, but this is exceptional. On one occasion, where there was a great deal of oozing from the pedicle stumps which we could not control, and where the patient's condition did not warrant entering the abdomen, we put in a large de Ribes bag, inflated it with water and pulled it down tightly over the pedicle area, later attaching it to a full ginger ale bottle which hung over the foot of the bed. This was removed after 12 hours.

A word about episiotomy. We do this as a preliminary measure under the following conditions (1) where we do the Schauta vaginal hysterectomy for early carcinoma of the cervix, (2) where the patient is a virgin, (3) where in postmenopausal married nulliparæ the introitus has undergone shrinkage, and (4) in women with long vaginæ where the cervix looks far away. It is surprising how much closer this procedure brings one to the seat of operation, and on occasion it has saved us a lot of sweat and pother.



Our apology for describing the operation in such detail is that we felt that some of the wrinkles included in it, which we ourselves had to learn the hard way, might prove more helpful than leaving it at a bare textbook description, or not describing it at all. As we look back, the greatest difficulties we encountered were due to the following. (1) Failure to get proper visualization—which the Heaney-Simon retractor overcame for us. (2) Failure to get the proper plane of cleavage between cervix and bladder—which we overcame by making our incision high enough up on the cervix and then cutting boldly through the pubo-cervical ligament with the scissors. (3) Failure to get into the pouch of Douglas, which we overcame with the high incision and by cutting backwards against tissue rather than forwards. (4) Doing the operation on cases where one or more previous pelvic operations had been performed. (5) Trying to secure elusive bleeding points in the pedicle area, which occasionally forced us to open the abdomen.

#### CONCLUSIONS

As a result of our experience with hysterectomy, we believe (1) that the vaginal operation is much safer than the abdominal, being associated with a considerably lower morbidity and mortality, and should be done in preference to the abdominal wherever possible; (2) that while it is, technically speaking, a more difficult operation to master, it actually becomes, when once mastered, an easier operation than the abdominal and one that can be performed in shorter time; (3) that, beyond offering additional safety to the patient, it confers the economic boon of allowing her out of hospital and back to work considerably sooner.

119 S. Park St.