HYSTERECTOMY*

A STUDY OF TYPES, POINTS OF TECHNIC AND CONCLUSIONS

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AN analysis of all hysterectomies performed on the author's service from March 10, 1946, to March 10, 1948 is herewith presented. There have been 161 hysterectomies done by six operators during this two-year period. Many articles have been written on this subject but the writer believes that certain phases can be repeated for emphasis while others may be brought to the front. This article deals primarily with the routine as carried out plus an attempt toward an honest appraisal of that routine.

GENERAL CONSIDERATIONS

The decision of whether or not to perform a hysterectomy is often a difficult problem and many factors must be considered before reaching a decision. There are two important factors which must be accepted before arriving at a decision: (1) The psychologic effect on the patient; usually the younger the patient, the greater the psychic trauma. Steps should always be taken to minimize this trauma. (2) The menopause will occur at an earlier age, and the younger the patient when the hysterectomy is performed the younger she will be at her menopause.

Experience has taught this writer that certain general principles should be followed when possible:

1. The uterus should never be left intact when both ovaries have been removed. Uterine bleeding often occurs and will continue in spite of all measures to control it unless another operation is performed to remove the uterus. Also, a "dead organ" is left which may be the future source of carcinoma and it serves no useful purpose. Therefore, many hysterectomies were done for adnexal disease rather than uterine disease.

2. In women who are forty years old or older with a prolapse requiring surgery a hysterectomy should be done, with few exceptions, plus repair of the pelvic structures.

3. Serious consideration should be given to removal of the ovaries, as well as the uterus, in all women with symptoms of menopause, and in those forty-five years or older even though they appear normal at the time. Needless to say, these organs always should be removed if there is a question of malignancy.

Therefore, a normal uterus will be removed for: (1) Malignancy of the ovaries, (2) tuberculous salpingitis, (3) certain cases of prolapse, especially in women forty years of age or older, (4) severe and uncontrollable bleeding at or near the menopause, (5) inflammatory conditions requiring removal of the ovaries and (6) other conditions which require removal of the second ovary. Also, normal ovaries will be removed for: (1) Cervical and fundal malignancies and (2) benign conditions requiring hysterectomy in women at or near the menopause.

TYPES OF HYSTERECTOMY

Supracervical. As improvements in technic are evolved and antibiotics are used more and more indications for supracervical hysterectomy become harder to justify. Transfusions, also, have further narrowed the indications for this procedure. Briefly, during this period the supracervical

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procedure was done only in nulliparous women who had a healthy cervix without a history of leukorrhea or previous trouble with the cervix. Furthermore, it was done only for benign conditions.

Partial hysterectomy was done twenty-one times for fibroids, twice for severe menorrhagia with one removed ovary and the other cystic, three times for menorrhagia with both ovaries already removed, once for severe menopausal bleeding, five times for a frozen pelvis from an inflammatory condition of long-standing and twice for postabortal pelvic abscesses.

Total Abdominal. Indications for total hysterectomy probably could best be summarized with the words that it should be done in all cases in which hysterectomy is indicated. Prevention of carcinoma in the remaining cervix is sufficient reason for doing a total hysterectomy in benignancy as long as the operation does not introduce an element of extra danger to the patient.

Total Vaginal. In this series all vaginal hysterectomies were of the total type and were associated with vaginal repair. The limitations and advantages of this procedure are too well known to warrant discussion. Vaginal hysterectomy was done twice for fibroids and associated cystocele and rectocele, once for menorrhagia of the menopause associated with a prolapse of the uterus, seven times for third degree prolapse of the uterus and once for hypertrophy of the cervix and acute cervicitis.

Radical Hysterectomy. Radical hysterectomy has been used only for cervical carcinoma and it was done twice for each of stages I, II and III (as outlined in a report of the League of Nations). The type of procedure has been more radical than that advocated by Wertheim and really was of the Latzko type. All procedures were preceded by irradiation with 4,000 mg. hours of radium used interstitially, as well as in tandem, in the cervical canal. There have been three stage IV cervical carcinomas which have been considered inoperable. It will be noted that this procedure has not been used for carcinoma *in situ* (intra-epithelial carcinoma) but rather a "wide" total hysterectomy, bilateral oophorectomy and salpingectomy have been done. Follow-ups for a longer period of time may indicate the radical procedure for these lesions also.

PREOPERATIVE PREPARATION AND POSTOPERATIVE CARE

As with any other type of operation the patients were given a thorough physical examination, including complete blood counts, urinalyses and any other examination indicated. Good sedation the night before was given to insure a full night's rest. The day before surgery the patient was given 2,000 cc. of high caloric liquids in addition to a regular, high protein diet. Enemas were seldom used as they seemed to irritate the bowel and result in greater distention. The morning of surgery the patient was sedated well with nembutal, scopolamine and morphine. Vaginal douching has not been used by this writer for many years.

Those patients being operated upon for malignancy have a urologic study, proctoscopic examination, chest and bone x-ray survey before operation; distant metastasis was a contraindication to surgery. In cases of fundal carcinoma the cervix was sutured closed before the abdomen was opened. With the simplest of patients excepted, all were typed and cross-matched preoperatively.

Patients with carcinoma, except carcinoma *in situ*, were irradiated preoperatively. The patient was then checked every two weeks until the maximum reaction began to subside. This has varied from six to ten weeks.

Those patients who were to undergo the radical type of operation had catheters placed in their ureters shortly before surgery and they were left in place following surgery for forty-eight hours or longer if the urine continued to show blood. It has been thought that the splinting action of the catheters postoperatively helps prevent ureteral complications.

The anesthesia for these patients was spinal, with gas-ether in those with some contraindication to a spinal, usually hypertension. Continuous spinal was used for all the radical operations in this series. Blood was given continuously during the radical procedure and the speed varied to keep the patient's condition satisfactory. Blood was always available for other patients who were likely to need it.

Postoperative care was usually routine with the following possible exceptions: (1) Oxygen was used freely to combat distention, especially in the radical patients. (2) All patients were encouraged to eat as soon as they tolerated food and as nearly a regular diet as possible. (3) If the patients did not tolerate foods and fluids after the first day or two, they were given intravenous proteins, glucose and saline in proportion to maintain electrolytic balance. (4) Penicillin was given in doses of 60 to 100 thousand unit doses every three hours in all those with radical cases and in 81 per cent of those remaining with total hysterectomies. This was continued for forty doses or five days unless indicated for a longer period. (5) Patients were encouraged to get out of bed on the second or third day.

TECHNIC

Supracervical. The essential variation from the routine was the round ligaments were ligated near the lateral wall and were not used to suture to the cervical stump. This procedure eliminates the pain from pull on the round ligaments, and since the normal supports are not disturbed in supracervical hysterectomy, the round ligaments are not needed for that purpose.

Total Abdominal. The following variations have been found very useful: (1) The round ligaments were cut near the lateral wall; (2) the pubocervical fascia was detached from the cervix and pushed downward; (3) a single suture was passed around the cardinal and uterosacral ligaments on each side and then they were detached. This procedure minimizes hemorrhage greatly, as well as allowing the upper end of the vagina to come up higher from the pelvis, making removal of the cervix from the vagina much easier; (4) the pubocervical fascia, the cardinal ligament and the uterosacral ligament all were sutured to the angle of the vagina by a single, special suture on either side; (5) no further sutures were used in the vaginal cuff; (6) a tape drain, doubled, was placed through the cuff into the vagina in order to drain the subperitoneal space when the reflection of the bladder peritoneum was closed to the posterior peritoneum; (7) when the vagina was opened, it was held high in the pelvis while one or two 4 by 4 gauze "flats" were pushed into the vagina to prevent spillage, an abdominal pack having been placed in the cul-de-sac previously.

Total Vaginal. Vaginal hysterectomy was usually conventional except for the following: (1) The anterior vaginal wall was opened and the bladder freely mobilized before proceeding with the hysterectomy; (2) the pubocervical fascia, cardinal ligaments and uterosacral ligaments were anchored at the angles of the vagina as just described; (3) the peritoneum was then closed completely and a drain left in the vagina with the cuff left open; (4) cystocele repair was done; (5) the posterior vaginal repair was done next, taking care to unite the uterosacral ligaments together throughout their length to insure against enterocele which occasionally occurs with the usual procedures. Pryor clamps were not used for any patients in this series.

Radical Type. Special points in this procedure were: (1) Catheterization of the ureters leaving the catheters in place as noted earlier; (2) care was taken to preserve the ureteral blood supply; (3) more radical removal of the glands and cul-de-sac peritoneum was done than in the classical Wertheim procedure; (4) no attempt was made to close the vagina but gauze or oxycel was used from the defect through the vagina to control oozing and promote free drainage.

CLINICAL COURSE

Supracervical. From Table 1 one may get a pictorial view of the clinical course. During operation there was one ureter cut but it was repaired and the follow-ups for some two years have shown no evidence of severe penicillin urticarial reaction; one patient had a severe concurrent bronchiectasis; there was one pelvic abscess and one patient showed partial intestinal obstruction on the seventh postoperative day which was relieved by conservative measures. There were 15.45 per cent of these patients who received transfusions during, or soon after surgery and 2.72 per cent received plasma. There were 30.9 per cent of these patients who required postoperative catheterization. There was shortening of the vagina in one subject which interfered with vaginal function. At the six-weeks check-up there were vault granulations in 28.2 per cent, all of which cleared with one application of 20 per cent silver nitrate. Morbidity was present in 13.63 per cent of these cases.

TABLE 1
SUMMARY OF CLINICAL FINDINGS

Type Operation	Total Cases	Age	Operators	Transfusions	Plasma Alone	Postoperative Catheterization	Short Vagina	Vault Granulations	Morbidity	Para 0	1	2	3	4	5	6	7
Radical...	6	27–53 38	1	6 100%	0 ..	6 100%	6 100%	3 50%	5 83.3%	1	..		4	1			
Total.....	110	21–53 41.5	4	17 15.45%	3 2.7%	34 30.9%	1 0.9%	31 28.2%	15 13.6%	21	38	22	18	7	1	2	1
Subtotal...	34	22–48 31.8	4	4 11.76%	0 ..	12 35.3%	0 ..	..	5 14.7%	31	1	1	1				
Vaginal....	11	34–53 42	2	2 18.2%	0 ..	11 100%	0 ..	3 27.2%	5 45.4%	..	..	5	4	1		1	

of stricture. There was one patient who had a concurrent acid-fast infection of a main bronchus. After her recovery from the hysterectomy a pneumonectomy was done. She is doing quite well fifteen months following the latter procedure. Four patients, or 11.76 per cent, received transfusions during or immediately following surgery. Postoperative catheterization was necessary in 35.5 per cent. There was morbidity in 14.7 per cent of these patients, consisting of a temperature of 100.4°F. or above on any two consecutive days, including the day of operation. This same criteria was used for morbidity in all cases of hysterectomy.

Total Abdominal. The complications in this group proved more annoying than serious. There were some seven cases which caused concern. One patient went into shock from acute gastric distention; there was one case of severe shock, apparently postanesthetic, as there was no hemorrhage and one case of acute upper respiratory infection; one patient had a severe chill on the third postoperative day and the cause was never determined; there was one case

Vaginal. Cystitis of a mild degree was present in all these cases following either repeated catheterization or a retention catheter. Both methods were used and with comparable reactions in the patient. There were two cases of severe, acute cystitis. Had a vaginoplastic procedure not been done in these cases, cystitis would surely have been less of a problem. There were 18.2 per cent who received transfusions and none were given plasma. There were vault granulations at six weeks in 27.2 per cent of the patients, and in all but one the condition cleared with one applica-

tion of silver nitrate while that one cleared following the second application. Morbidity was recorded in 45.5 per cent of these patients in spite of the fact that their general well being was better than in those in the group of abdominal totals. There was one patient found to have an enterocele of a mild degree one year following surgery. This has not necessitated repair and does not seem to be progressing. One subject developed severe sciatica on the right side which subsided in about three weeks.

Radical. Strange as it may seem, this is the only group showing no complications other than morbidity. However, such a small number of cases is of no statistical value; furthermore, preoperative preparation, blood during surgery, etc., made these patients as nearly an ideal risk as possible. There were no fistulas or pelvic abscesses. All these patients are living and have shown no evidence of recurrence although it is too soon for this fact to mean much.

CONCLUSIONS

When complications and morbidity are taken into account, there seems to be practically no justification for supracervical hysterectomy except in training younger men and then only in nulliparous women who have no history or findings suggestive of cervical infection.

The uterus should always be removed when the ovaries are removed. Therefore, many hysterectomies should be done for adnexal disease rather than uterine disease. Women who are forty years of age or more, with a prolapse requiring surgery in general, should have vaginal hysterectomy plus vaginoplasty. In women near the menopause or older serious consideration should always be given to removal of the ovaries.

Radical hysterectomy is recommended in all stages (I and II) and certain stage-III cases of epidermoid carcinoma of the cervix as well as some cases of adenocarcinoma of the fundus all following radium irradiation. Irradiation does not seem to destroy malignancy in the lymph glands. It has not been deemed advisable to do radical surgery for carcinoma *in situ*. Ureteral catheters were used in all these cases during and following surgery.

The better the preoperative and postoperative care the quicker will be the recovery of the patient. Early rising definitely seems to aid recovery and there were no cases of thrombophlebitis or phlebothrombosis diagnosed in any case postoperatively. It would seem that penicillin postoperatively in 60 to 100 thousand unit doses every three hours for forty doses is of definite value.

Support of the vagina and cervix should come from proper attention to the uterosacral and cardinal ligaments and pubocervical fascia; the round ligaments should be left unattached. Leaving the vaginal cuff open seems to be most beneficial and healing occurs as rapidly as when it is closed. Granulations in the cuff at six weeks are no more frequent in these cases. When a vaginal hysterectomy is done, the uterosacral ligaments should be approximated around the rectum and forward to the vagina to prevent enterocele at a later date.

It is interesting to note that the average temperature curve was normal in all groups by the seventh postoperative day and that the highest composite curves were normal only a day later. Therefore, morbidity *per se* seems to be of little or no significance and when unassociated with other conditions should cause no great concern. Morbidity was essentially the same in total and subtotal groups. There is more blood loss in the vaginal, the total, (abdominal) and supracervical, in order, as indicated by transfusions needed. The radical, of course, always necessitates transfusion for the best interest of the patient. Postoperative catheterizations were 35.3 per cent in the subtotal group as compared with 30.9 per cent in the total group.

Shortening of the vagina occurs in fully 50 per cent of the radical cases sufficient to interfere with its function but was a problem in only one other case.

If one groups some of these cases under the principal indication, one will find that seventy-two cases, or 44.5 per cent, were of fibroid tumors; twenty-seven cases, or 16.8 per cent, were of inflammatory conditions; twenty-four cases, or 14.9 per cent, of menorrhagia; twelve cases, or 7.4 per cent, of uterine malignancy; five cases, or 3.1 per cent, of ovarian tumors, four of which were malignant; therefore, 10 per cent of the hysterectomies were done for malignancies. The remaining twenty-one cases, or approximately 13 per cent, were of miscellaneous conditions.

TABLE II
OPERATIVE PROCEDURES

Procedures	Partial	Total	Vaginal	Radical	Total
Both ovaries, tubes and uterus	7	60	..	..	67
Both ovaries, tubes, appendix and uterus	2	7	..	..	9
One ovary, tube, appendix and uterus	1	8	..	..	9
Uterus alone	16	13	..	..	29
Uterus and appendix only	7	11	..	..	18
One ovary and uterus	1	..	..	..	1
One ovary, tube and uterus	..	11	..	..	11
Uterus plus anterior and posterior repair	..	..	11	..	11
Ovaries, tubes, glands, fat, etc	..	..	..	3	3
Ovaries, tubes, glands, fat and appendix	..	..	..	3	3
Total	..	..	..	..	161

The associated operative procedures carried out may be seen in Table II. There were no deaths in this group of patients.

SUMMARY

1. The 161 hysterectomies done on the author's service from March 10, 1946, to March 10, 1948 are analyzed.

2. Important factors pertaining to the decision of the type operation and some general principles to be followed are discussed.

3. Special points of technic are brought out.

4. Associated operative procedures and summary of clinical findings are diagrammatically illustrated in Table I and II.

5. Various conclusions are discussed.