

A COMPARATIVE STUDY OF SUBTOTAL AND TOTAL HYSTERECTOMIES*

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THE relative merits of total and subtotal hysterectomy have long been a matter of controversy. It is obviously difficult to evaluate properly the advantages and disadvantages of each in a small series of cases performed by any one individual surgeon. Nor would it be of any value to select isolated cases from a group of individual operators. One of us¹ reviewed a series of cases at a private institution where there were only three operators. It is with this thought in mind that a statistical review was made of 550 consecutive hysterectomies performed by forty-eight different surgeons plus the resident staff, the latter working directly under supervision and closely following the technique of the attending gynecologist.

Before presenting the series of cases it would seem advisable briefly to review the current literature, especially those papers in which a relatively large series of cases are analyzed.

Siddall and Mack² have collected a series of cases from the literature comprising 7,795 subtotal and 4,559 total hysterectomies. To this series they added 1,141 cases of subtotal and 235 cases of total hysterectomy from one hospital. If to this group is added a series of cases reported by Gardiner and Kretzschmar,³ the total number of cases reported will be 9,606 subtotal hysterectomies and 4,985 total hysterectomies.

The combined ratio of total to subtotal is approximately 1:2 and the combined mortality is 3 per cent in the subtotal group and 3.56 per cent in the total group. This we believe to be a fairly representative group of cases seen throughout the country

in well organized hospitals of accredited standing.

A further analysis of the individual reports bring out some extremely interesting facts. From the analysis in Table I it

TABLE I

	Subtotal Hysterectomies		Total Hysterectomies	
	Number	Per Cent Mortality	Number	Per Cent Mortality
Masson.....	217	1.8	229	1.3
Nelson.....	122	3.2	476	2.9
Fullerton and Faulkner	609	4.4	1,078	4.1
Burch and Burch.....	166	4.2	32	3.1
Mayo and Mayo.....	3,085	1.2	1,588	1.8
Greenhill.....	1,857	4.47	551	4.72
Nead and Bill.....	1,739	2.1	605	3.1
Siddall and Mack.....	1,141	2.6	235	6.4
Gardiner and Kretzschmar.....	670	3.1	191	4.7
Total.....	9,606	3	4,985	3.56

appears obvious that the greater the number of total hysterectomies done in any one series, the lower the mortality (with the exception of the series reported by Burch and Burch). It would seem only logical to assume that the greater skill developed by performing an increasing number of total hysterectomies would diminish the mortality percentage on a

TABLE II
WOMAN'S HOSPITAL SERIES

	Subtotal	Total
Number of cases.....	350	200
Youngest.....	23 years	23 years
Oldest.....	68 years	62 years
Average.....	38.5 years	39 years
Number of operators 48		

* From Woman's Hospital, Detroit, Michigan.

technical basis. It would certainly not deter the surgeon from the procedure because of relative unfamiliarity, provided other considerations were equal.

The average age in both groups is for all practical purposes the same. The number of individual operators is sufficiently large and varied in gynecological experience and skill to permit a fairly accurate general interpretation of the subsequent statistical tables.

TABLE III
SYMPTOMOLOGY

	No. of Cases	Percentage
1. Bleeding.....	242	48.0
2. Abdominal pain.....	170	30.9
3. Abdominal mass.....	61	11.1
4. Backache.....	40	7.3
5. Frequency.....	20	3.6
6. Procidencia.....	6	1.1

The symptoms presented were mainly bleeding, abdominal pain and abdominal mass. These symptoms were present either singly or in combination in approximately 90 per cent of all cases. The most common symptoms were vaginal bleeding—48 per cent; abdominal pain—30.9 per cent; and abdominal mass—11.1 per cent. Other less constant symptoms were backache, frequency and procidencia.

TABLE IV
ANESTHESIA

	Subtotal		Total		Combined	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Gas-ether.....	307	87.4	150	75	457	83
Spinal.....	35	10	21	10	56	10.2
Avertin.....	6	1.8	29	14.5	35	6.3
Gas.....	2	0.76	0		2	0.36
Average duration of operation.....	1 hour 15 minutes		1 hour 18 minutes			

In the entire group the anesthetic use in 83 per cent of the cases was gas induction and ether. Spinal anesthesia was used in 10.2 per cent; avertin as a basal anesthetic in 6.3 per cent, and in only two cases, or 0.36 per cent, was gas alone used. It is interesting to note that in the choice of anesthesia, the percentage of the individual anesthetics employed in each group is practically alike, except in the use of an avertin basal anesthesia. This was used in

five times as many total as subtotal cases. Whether the use of avertin had any effect on the immediate postoperative morbidity one is unable to state definitely. It should, however, be noted that the patients required closer observation during the first twelve postoperative hours.

As to the duration of operation, only three more minutes on the average were required to complete the operation of total hysterectomy as compared to subtotal. Certainly the time element is of no great significance, and should not be an influencing factor in deciding against total hysterectomy.

TABLE V
ADNEXAL AND ADDITIONAL OPERATIONS

	Subtotal		Total		Subtotal and Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
1. Bilateral salpingo-ophorectomy.....	100	28.9	76	38	176	32
2. Unilateral salpingo-ophorectomy.....	70	17.1	66	33	136	24.7
3. Salpingectomy.....	14	4	4	2	18	3.3
4. Oophorectomy.....	22	6.2	6	3	28	5.1
5. Appendectomy.....	208	59.7	108	54	316	57.4
6. Dilatation and curettage.....	24	6.4	10	5	34	6.2

In the entire group additional adnexal operations were done in 65.1 per cent. In the subtotal group alone, these operations were done in 56.2 per cent. Of these 35.1 per cent had all ovarian tissue removed. In the total group 76 per cent had adnexal operations, but only 41 per cent had all ovarian tissue removed. Although 19.8 per cent more of the total group had adnexal operations, only 4.9 more in this group had all ovarian tissue removed.

The percentage of appendectomies in both groups is higher in the subtotal group, but since these were prophylactic measures one can attach no significance to this.

In the subtotal group 8 per cent of the cases developed complications, while in the total group 13.5 per cent developed complications. Patients in the total group had 19.8 per cent more adnexal operations as compared to the subtotal group. This undoubtedly has some direct effect on the morbidity, although one is unable to make this assertion upon sound scientific basis.

Peculiarly enough, there were five cases of postoperative shock in the subtotal group. Obviously then, in this series postoperative shock is not an important deciding factor, since this complication occurred at least as often in both types of operation.

However, when we consider pulmonary embolus, it is found that whereas only two cases in the subtotal group were involved, in the total group five had this serious complication. Some writers have reported more cases of pulmonary embolism in the subtotal group and they believe that there is less venous trauma in the total group where more of the veins are excised.

In the subtotal group one patient developed a troublesome cystitis and in one case the bladder was opened at the time of operation. In the total group, while there were also only two complications involving the genitourinary tract, they were of a more serious nature, a bladder fistula and a bladder and rectal fistula. Although much mention is made of the fact that the total operation endangers the bladder, ureters and rectum, in this series this complication was encountered only in two cases, or 1 per cent, and not in a single instance were the ureters damaged.

Minor postoperative vaginal bleeding occurred in two of the total group, both on the second postoperative day. There was none in the subtotal group.

While only one case of pelvic peritonitis is listed in the subtotal group, it is well to note now that in the mortality table there are two cases of generalized peritonitis in each group with fatal termination.

The other complications listed are not peculiar to either type of operation, but rather to abdominal surgery in general, and do not hold any special significance.

The average stay in the hospital was only 0.6 day more in the total group than in the subtotal group.

The temperature peak in both groups was reached on the first or second postoperative day and subsided gradually to normal on the fourth or fifth postoperative

day. The average highest temperature was only 0.2 per cent of a degree higher in the total group than in the subtotal group.

TABLE VI
MORTALITY—LISTED CAUSES OF DEATH

	Entire Series	Total	Subtotal
Peritonitis	4	2	2
Evisceration	2	0	2
Malignancy with meta- stasis	1	0	1
Pulmonary embolus	1	0	1
Paralytic ileus	1	0	1
Cardiac failure	2	2	0
Anuria with nephritis	1	1	0
Total	12	5	7

In the entire group of 200 total hysterectomies there were only two deaths due to peritonitis, or 1 per cent mortality. This mortality is not particularly high in view of the pathology of the tissues involved, and does not necessarily bear out the contention that opening the vaginal vault predisposes to peritonitis. An equal number of fatal peritonitis cases was encountered in the subtotal group, although the percentage of mortality here was somewhat lower, 0.6 per cent. The other fatal complications cannot be classed as contraindicating either one or the other type of hysterectomy. Thus two fatal cases of evisceration occurred in the subtotal group, and two cardiac deaths in the total group. The death due to anuria with nephritis is interesting, more from the view of previous antiluetic therapy and its relation to anaesthetic rather than to the choice of surgical procedure. There was no damage to the ureters during the surgical procedure, and so it cannot be considered as a complication peculiar to the procedure carried out.

DISCUSSION

From the cases analyzed in the literature and the series of cases from Woman's Hospital, certain factors lend themselves to generalization.

The mortality and morbidity in total hysterectomy is slightly higher than in subtotal in a general hospital with a large group of operators. The total operation as such must therefore be considered a more formidable procedure. Yet it has been shown that the more frequently this procedure is employed and the more familiar

the surgeon becomes with the operation, the lower the mortality.

To guard against the possibility of coexisting carcinoma, a routine vaginal preparation is of the utmost importance. Under anesthesia and ideal operating room facilities it is only a matter of a few minutes to reexamine the patient and whenever indicated to do a diagnostic curettage and frozen section.

It has been stated that the cervical stump is necessary to act as a keystone of the arch to prevent prolapse after hysterectomy. Actually this is a rare occurrence following total hysterectomy providing the round ligaments are properly suspended. With regard to leucorrhea and backache, Nelson¹ has encountered less difficulty with these troublesome sequelae in his total group than in the subtotal group, and Gardiner and Kretzschmar³ report a 7 per cent higher incidence in the subtotal as compared to the total group.

It is not the purpose of this discussion to advocate the use of total hysterectomy rather than subtotal and vice versa. Rather it would be well to emphasize that in view of the above considerations total hysterectomy is not so formidable as to greatly limit its more general utilization. The general physical condition of the patient, the pathology present and the age must always be influencing factors, even to the surgeon who is equally familiar with both procedures.

Richardson⁷ refers to the types of cases that are suitable for subtotal hysterectomies, as:

1. Those women requiring hysterectomy for benign disease who possess perfectly normal cervixes.

2. Those instances in which the operative hazard compels the execution of conservative surgery.

3. Those cases where, for good and sufficient reasons, it is of paramount importance to preserve the menstrual function.

4. Most cases requiring hysterectomy during pregnancy.

These are factors well worth pondering. It would also appear advisable to consider the endocrine status of the patient following subtotal or total hysterectomy and its relation to the onset of menopausal symptoms. It has been shown that the normal woman in going through her menopause has an increase in her blood prolan and a decrease in blood estrin. Marx, Catchpole and McKennan,⁴ working with a series of twenty-one clinical patients, after a

careful and detailed study showed that the patient who had a total hysterectomy is more likely to undergo her menopause at an earlier date than the patient who had a subtotal hysterectomy. It is their belief that the uterine endometrium elaborates a catalytic principle acting on the pituitary-ovarian hormonal mechanism, regulating its normal balance and functional harmony. This phase of the problem is extremely interesting, and like all endocrine studies, additional work with a larger group of patients should be conducted before definite conclusions can be drawn.

CONCLUSIONS

1. A series of 550 abdominal hysterectomies from the Woman's Hospital is presented. The cases covered a period of 4½ years and included 350 subtotal and 200 total hysterectomies.

2. This series shows a slightly higher mortality and morbidity for the total group. It must be borne in mind, however, that the difference is not sufficiently great to justify a decision against this procedure where there are indications for its use.

3. The total hysterectomy should be more frequently done in those cases where the cervix shows signs suspicious of pre-malignant states. Only too frequently is a malignancy of the cervix encountered shortly after subtotal hysterectomy. Undoubtedly there was a coexisting early malignancy of the cervix at the time of operation.

4. Clinical follow-up in the total group with relation to the endocrinological disturbances caused by removal of the cervical stump needs further study.

5. This problem should not be considered in the light of total versus subtotal hysterectomy.

It would be much better for the surgeon equally familiar with both procedures to employ the one which appears to be indicated in each individual case.

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PROLAN (from the chorionic cells of the human pregnant uterus), the gonadotropic hormone characteristic of pregnant-mare serum (likewise probably secreted by chorionic or endometrial cells), and the gonadotropic hormones of neoplasms such as hydatidiform mole, chorionepithelioma, and testicular tumor (from the cells of the neoplasm) . . . appear not to be secreted by the hypophysis.

From—"The Physiology and Pharmacology of the Pituitary Body," vol. II, by H. B. Van Dyke (University of Chicago Press).