

# Comparison of abdominal and vaginal hysterectomy

## *Study of complications*

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*Summary: Background.* To compare patient characteristics, diagnoses and complications associated with vaginal or abdominal hysterectomy in the last two decades.

*Study design.* From 1974 to 1994, 6.420 women were included in the study. Complications were classified in two categories: intraoperative and postoperative, and psychosexual complications.

*Results.* Women who underwent vaginal hysterectomy experienced significantly fewer complications than women who had undergone abdominal hysterectomy. Vagina hysterectomy was associated with less febrile morbidity, bleeding requiring transfusion and convalescence than abdominal hysterectomy.

*Conclusions.* Hysterectomy is highly effective for relief of symptoms associated with common non-malignant gynecologic conditions. There is a minimal risk of complications among women undergoing hysterectomy by the abdominal and vaginal route.

*Key words:* Vaginal hysterectomy; Complications; Abdominal hysterectomy; Indication; Trends.

## INTRODUCTION

Surgical advances in the 19th and 20th centuries made hysterectomy a safe and effective procedure. Hysterectomy was the most common major surgical procedure performed nationally until 1985,

until it became the second-most-common major surgical procedure after the increase in births by cesarean delivery (<sup>1</sup>). Although current data show a decline in the rate of hysterectomies, a further increase in the actual number has been projected by some, because of an expected growth in the population of older age groups. The most common age at which hysterectomy is performed is 40-45 years (<sup>2</sup>).

Few recent studies have examined the risk of morbidity after vaginal or abdominal hysterectomy among women of reproductive age (<sup>3,4</sup>). Most have included women of all ages with benign and malignant conditions. This report examines the complications of hysterectomies performed at a hospital. We examined the

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risks of complications among women undergoing hysterectomy by the abdominal and vaginal approaches.

## MATERIAL AND METHODS

Between 1974 and 1994, a total of 6420 hysterectomies were performed at the "Areteion" Hospital. Of these women, 1520 were scheduled for vaginal hysterectomy and 4900 were to have abdominal hysterectomy. On the women operated, 43 percent were multiparous, 30 percent were uniparous and 27 percent were nulliparous. In the last decade we had a greater number of uniparous patients (33%). The ages of the patients ranged from 42 to 87 years with a mean of  $\pm 53$  years.

Patients with preoperative uterine sizes less than 12 weeks gestation (as established by ACOG) were considered candidates for the vaginal approach. This surgical procedure was usually performed on women with mobile uteri, with uterine descent and without significant pelvic adhesions.

The complications of either abdominal or vaginal hysterectomy were divided into two categories: 1) intraoperative and postoperative complications, 2) psychosexual complications.

Postoperative pyrexia was defined as a temperature of  $\geq 38^{\circ}\text{C}$  on two or more occasions, excluding the first 24 hours after operation. Urinary tract infection was defined as  $\geq 10^5$  organisms/ml in a midstream specimen of uterine or a catheter specimen of uterine if the patient was catheterized, whether symptoms were present or not. Long-term pelvic pain was assumed to be absent if the patients were not referred to the gynaecological outpatient clinic with pain in the first 3 months after hysterectomy. Vaginal vault infection was diagnosed in patients who had a purulent discharge in association with tender induration at the vault and in whom upper vaginal cultures produced a growth of pathogens. The postoperative course was considered febrile if any oral temperature reached  $100.4^{\circ}\text{F}$  or greater. Urinary retention was regarded as prolonged if a bladder catheter was necessary after the seventh postoperative day.

All surgical procedures were performed with patients under general anesthesia. Each patient received one intravenous dose of a prophylactic antibiotic during the surgical procedure, two 500 mg injections of intramuscular cephazolin at 12-hour intervals followed by 250 mg of oral cephalixin at 6-hour intervals for 6 days.

Blood loss was defined as excessive if any two of the following three criteria were met.

Blood loss estimated by the surgeon of 600 ml or greater, fall in hematocrit of 4 vol. % or

greater from the preoperative level to that on the second postoperative day, or blood transfusion during the operation or within the 6 hours immediately following it.

Statistical significance was determined by the  $\chi^2$  test.

## RESULTS

Table 1 lists information regarding intraoperative and postoperative complications. Postoperative febrile morbidity, followed by intraoperative hemorrhage, is the most frequent complication of hysterectomy. The most common preoperative indication for abdominal hysterectomy was leiomyoma. Pelvic relaxation was the most common indication for vaginal hysterectomy (Table 2).

Urinary tract injury is a serious but infrequent complication of hysterectomy that tends to occur when there are extensive adhesions. Bowel injury usually occurs with abdominal hysterectomy.

Table 1. — *Intraoperative and postoperative complications of hysterectomy.*

|                           | Abdominal<br>hysterectomy<br>n = 4900 | Vaginal<br>hysterectomy<br>n = 1520 |
|---------------------------|---------------------------------------|-------------------------------------|
| Intraoperative            |                                       |                                     |
| hemorrhage . . . .        | 132                                   | 41                                  |
| Lesion of the bladder .   | 47                                    | 21                                  |
| Lesion of the rectum .    | 46                                    | 15                                  |
| Laparotomy necessary .    | —                                     | 2                                   |
| Deep-vein                 |                                       |                                     |
| thrombophlebitis . . .    | 43                                    | 11                                  |
| Pelvic cellulitis . . .   | 42                                    | 18                                  |
| Pelvic abscess . . . .    | 19                                    | 5                                   |
| Urinary tract infection . | 107                                   | 40                                  |
| Pulmonary embolism . .    | 0                                     | 0                                   |
| Intestinal obstruction .  | 21                                    | 3                                   |
| Urinary retention . . .   | 51                                    | 19                                  |
| Wound infection . . .     | 15                                    | 0                                   |
| Vaginal vault infection . | 34                                    | 11                                  |
| Febrile morbidity . . .   | 149                                   | 52                                  |
| Postoperative             |                                       |                                     |
| hemorrhage . . . .        | 45                                    | 25                                  |
| Nerve injuries . . . .    | 22                                    | 8                                   |

Table 2. — *Preoperative indications among women undergoing hysterectomy, by surgical approach.*

| Indication                          | Surgical approach |           |
|-------------------------------------|-------------------|-----------|
|                                     | Vaginal           | Abdominal |
| Leiomyomas . . . .                  | 281               | 2,289     |
| Ovarian tumors . . .                | —                 | 139       |
| Pelvic relaxation . . .             | 421               | —         |
| Endometriosis . . . .               | 117               | 122       |
| Adenomyosis . . . .                 | 354               | 672       |
| Endometrial polyps . .              | —                 | 212       |
| Cervical dysplasia . . .            | 22                | 211       |
| Pelvic inflammatory disease . . . . | —                 | 15        |
| Endometrial hyperplasia             | 100               | 581       |
| Hypermenorrhea . . .                | —                 | 161       |
| Endometrial cancer . .              | —                 | 409       |
| Dysmenorrhea . . . .                | 65                | 189       |
| Urinary incontinence .              | 270               | —         |
| Total . . . . .                     | 1520              | 4900      |

Bladder injury tends to occur during vaginal hysterectomy.

Removal of the uterus, which has a unique psychological significance for some women, may be associated with psychosexual manifestations. Some women view hysterectomy as a threat to their health, vitality and ability and may experience psychiatric problems after this surgery (Table 3). The psychosexual effects of hysterectomy appear to be determined by physical, psychologic, social and cultural factors. Preoperative education of women and their partners by a counselor may be useful in preventing psychosexual problems. Table 4 shows the other operative procedures associated with abdominal and vaginal hysterectomy. Salpingo-oophorectomy was the most common procedure in abdominal hysterectomy and posterior colpoplasty was the most common procedure with vaginal hysterectomy. Comparison of abdominal and vaginal hysterectomy showed significant differences in length of hospital stay (mean 5.1

versus 4.2 days, respectively), days in bed after surgery (mean 7.2 versus 5.7), and days of postoperative pain (mean 27 versus 18).

According to our results, a statistically significant difference regarding the frequency of appearance of bleeding between the surgical techniques was observed only in the presence of pelvic infection ( $p < 0.05$ ).

## DISCUSSION

With better recognition and treatment of complicating medical diseases, with proper use of blood transfusions and antibiotics, a hysterectomy can be done fairly safely by the gynecologic surgeon on today. It should be emphasized that the ability to perform several hundred hysterectomies with a low mortality and morbidity rate, is not ipso facto evidence that gynecologic surgery is being practiced correctly. The physician must be certain that only patients with proper indications

Table 3. — *Psychiatric problems after surgery.*

| Symptoms               | Vaginal route | Abdominal route |
|------------------------|---------------|-----------------|
| Depression . . . . .   | 20            | 93              |
| Anxiety . . . . .      | 32            | 69              |
| Sexual dysfunction . . | 21            | 39              |
| Total . . . . .        | 73            | 201             |

Table 4. — *Concurrent surgical procedures.*

| Procedure                        | Surgical approach |           |
|----------------------------------|-------------------|-----------|
|                                  | Vaginal           | Abdominal |
| Anterior colposcopy . .          | 270               | —         |
| Posterior colpoplasty .          | 894               | —         |
| Appendectomy . . . .             | —                 | 90        |
| Urethral suspension . .          | 54                | 229       |
| Unilateral salpingoophorectomy . | 67                | 468       |
| Bilateral salpingoophorectomy .  | 182               | 1,153     |

Table 5. — *Predisposing factors for the risk of in:ra/postoperative hemorrhage.*

| Risk factors               | Vaginal presence | Approach absence | Abdominal presence | Approach absence | $\chi^2$ | P    |
|----------------------------|------------------|------------------|--------------------|------------------|----------|------|
| Endometriosis . . . .      | 15               | 102              | 16                 | 106              | 0,016    | 0,90 |
| Large Uterus . . . .       | 36               | 538              | 69                 | 1.149            | 0,16     | 0,68 |
| Adhesions . . . .          | 14               | 168              | 25                 | 439              | 0,85     | 0,35 |
| Pelvic infection . . .     | 1                | 7                | 10                 | 5                | 4,15     | 0,04 |
| Postoperative infections . | 8                | 5                | 31                 | 187              | 0,02     | 0,88 |

are chosen for surgical treatment. The pyramid of successful practice of gynecologic surgery is complete with proper preparation of the patient for operation, proper performance of the operation, and proper postoperative care <sup>(5)</sup>.

More patients in 1990 had their appendages conserved than in 1980 and this seems to represent a change in gynaecological practice towards conservation. The patients who had their ovaries conserved were younger in 1990 compared with those in 1980, whereas the patients who had their ovaries removed did not differ between the two study years <sup>(6)</sup>. Ovarian function after hysterectomy is a critical issue since the data show that menopausal estrogen levels are associated with a sharp increase in the incidence of coronary artery disease <sup>(7)</sup>. If a bilateral oophorectomy is done, the ovaries must be removed completely. If a remnant of ovarian parenchyma is left remaining in a premenopausal women, it may eventually cause symptoms such as pelvic pain or dyspareunia (residual ovary syndrome) <sup>(8)</sup>. If the ovaries are conserved, the patient should be informed of the necessity for subsequent periodic follow-up examinations. The reported incidence of ovarian cancer in retained ovaries ranges from 1% to 14% <sup>(9)</sup>.

The overall complication rate was 32.8/100 for women who underwent abdominal hysterectomy and 21.5/100 for women who underwent vaginal hysterectomy. The median postoperative hospital stay and convalescent period were shortest for

women who underwent vaginal hysterectomy but there was no difference between vaginal hysterectomy without colporrhaphy and those who underwent vaginal hysterectomy with colporrhaphy.

Febrile morbidity occurs after the first 24 hours postoperatively at a rate of 15-38 per 100 women. The frequency of febricity with the vaginal approach has been reduced, often to same levels with those reported for abdominal cases. In some studies the use of antibiotic prophylaxis resulted in a 25% reduction in febrile morbidity as compared to that in the controls and a 5% incidence of postoperative infections as compared to 25% in the controls <sup>(10)</sup>. Recent data suggest, however, that routine prophylaxis with all vaginal surgery may not be necessary <sup>(11)</sup>.

Wound infection, a complication of abdominal hysterectomy, usually occurs in patients who are older or who have chronic diseases, poor nutrition or obesity and in the case of poor hemostasis. Vaginal cuff infection is more frequent in abdominal cases. The nerve injuries do not usually result in serious sequelae since spontaneous recovery occurs in the majority of patients in three to six months. These injuries are usually secondary to the patient's position during surgery <sup>(12)</sup>. In our study the most common injury was to the femoral nerve and occurred more frequently in the vaginal cases. Urinary tract injury tends to occur when there are extensive adhesions making separation and dissection of the anatomic

structures difficult (endometriosis, pelvic infection) <sup>(13)</sup>. Urinary retention occurred in among 10% of all women who had a vaginal hysterectomy but among only 5% of those who underwent vaginal hysterectomy without colporrhaphy.

Intraoperative and postoperative bleeding requiring transfusion are more frequent with abdominal than vaginal hysterectomies. The rates of lifethreatening events and rehospitalization were not significantly different. Hemorrhage, is more frequent in cases of extensive pelvic pathology, such as with severe endometriosis, adhesions or infections <sup>(14)</sup>. In only two patients we had to resort to the vaginal hysterectomy to laparotomy to complete the operation or arrest retroperitoneal hemorrhage. According to our results, with abdominal approach intra- and postoperative hemorrhage is observed more often in the presence of pelvic infection.

Fallopian tube prolapse has been reported sporadically. According to Dao and Cartwright, only approximately 70 cases of fallopian tube prolapse have been reported up to 1985, most of which followed vaginal hysterectomy <sup>(15)</sup>. Spontaneous and traumatic rupture of the vaginal vault following vaginal or abdominal hysterectomy may occur, but is rare. A sudden increase in intra-abdominal pressure may cause disruption of an incompletely healed vaginal vault incision. Traumatic vault rupture following coitus has also been reported <sup>(16, 17)</sup>.

Vaginal vault prolapse after hysterectomy is uncommon, occurring in 0.5% of all hysterectomies. It is suggested that inadequate attention to the occlusion of the pouch of Douglas or failure to identify an enterocele at the time of hysterectomy is the most common cause of posthysterectomy vaginal vault prolapse. Definitive treatment is surgical and includes sacral colpopexy, transvaginal sacrospinous ligament colpopexy or repositioning of the vagina over the levator

plate with an abdominoperineal procedure <sup>(18, 19)</sup>.

Caution is necessary in advising hysterectomy as there may be adverse psychiatric and cardiovascular sequelae, even when the ovaries are conserved. The preoperative education of women and their partners by a counselor may be useful in preventing psychosexual problems <sup>(20)</sup>. Richards demonstrated that depression requiring treatment was common after hysterectomy <sup>(21)</sup>, and this confirmed an earlier larger study by Barker <sup>(22)</sup>. These Authors showed that two groups of patients at risk of post-hysterectomy depression are those aged < 40 years and those with no organic disease. In our study patients aged < 50 years were at risk of post-hysterectomy depression and those > 55 years were at risk for sexual dysfunction. Compared to other prospective studies showing that hysterectomy does not generally lead to depression or greater levels of psychological distress <sup>(23, 24)</sup>, we found that 6% of women reported new problems with depression or anxiety 1 year after surgery.

For women undergoing hysterectomy, a reduction in the uterine bulk with GnRh agonists creates more readily identifiable planes of dissection, permits enucleation of myomas in a less traumatic fashion, decreases the total operative blood loss and allows easier access to operative areas that were previously obscured by the myomas <sup>(25)</sup>. Another alternative is the laparoscopy assisted vaginal hysterectomy. Although laparoscopically assisted vaginal hysterectomy is a recent innovation, there has been a rapid increase in its use. In a well-executed prospective study Summit *et al.* have shown that laparoscopy-assisted vaginal hysterectomy has no advantage over standard vaginal hysterectomy <sup>(26)</sup>. All studies that have examined cost, have shown that is more expensive than abdominal or vaginal hysterectomy <sup>(27)</sup>. Others have reported

that the laparoscopy approach offers the advantage of optional removal of the ovaries <sup>(28)</sup>. This new method should not be used by a surgeon who is not already well trained in vaginal surgery.

Mortality from hysterectomy in most medical centers is 1 to 2 per 1000 <sup>(29)</sup>. However, morbidity continues to be a problem. Complications of some sort may occur in as many as 25-50% of women who undergo this procedure. Complications are more prevalent in the case of serious pelvic pathology, when urgency to perform a hysterectomy is a factor, with a poor operative technique, when indwelling catheters are used, and when patients are older or have one or more chronic diseases. To reduce morbidity, appropriate preoperative preparation and close surveillance of the patient after surgery, should be made. Continued monitoring of hysterectomy rates, diagnoses, and surgical practice will be critical for an understanding of the appropriate use of hysterectomy, alternative therapies for uterine disorders, and future trends in women's health care.

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