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Seventeen-year review of hysterectomy procedures in a university clinic in İstanbul (1985–2001)

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Abstract Objective: Our objective was to review the hysterectomies performed in our clinic for the last 17 years to reveal the facts in relation to the operation. **Materials and methods:** The records of the patients who had undergone hysterectomy in İstanbul University Cerrahpaşa School of Medicine Department of Obstetrics and Gynecology between January 1985 and August 2001 were reviewed retrospectively. Students' *t*-test and one-way ANOVA test were utilized to compare the data of different hysterectomy groups. **Results:** Between 1985 and 2001, there were 3,956 women who had undergone hysterectomy operation in the Department of Obstetrics and Gynecology of Cerrahpaşa School of Medicine, İstanbul University. There were 3,274 (82.7%) total abdominal hysterectomies (TAH), 424 (10.7%) total vaginal hysterectomies (TVH), 28 (0.7%) subtotal hysterectomies and 230 (5.8%) radical hysterectomies. There were no significant differences in the distribution of hysterectomy type with respect to interval of years. The common indications for hysterectomy were myoma uteri (38.49%), followed by gynecological cancers (21.6%) and uterine prolapse (11.9%). The rate of concurrent procedures were 87.3% for TAH (2,856/3,274) and 95.8% for TVH (406/424). The rate of 'unjustified' hysterectomies (pathological diagnosis that is inappropriate to the indication of the operation) determined as 8.9% in all of the cases. The pathological examination of the specimen was normal in 170 cases (5.1%) of TAH. This rate was 42.1% (183/435) in TVH group. In the TAH group there was no complication in 86.5% of the cases while it was 89.3% in the TVH group. The most common complica-

tion was febrile morbidity in the whole group. During the study period, 5 deaths that can be attributed to the hysterectomy operation were observed. The mortality rate was calculated as 0.1% for hysterectomy operation in the study period. **Conclusion:** Although it is widely performed, hysterectomy is a relatively safe surgical procedure. The morbidity and mortality of the operation may be further decreased by the efforts to minimize the rate of the unnecessary hysterectomies and selecting the most appropriate mode for the surgery.

Keywords Hysterectomy · Operation · Surgery · Gynaecological

Introduction

Hysterectomy is the second most frequently performed major operation after cesarean section among women of reproductive age [41, 42, 44, 46]. The number of hysterectomies performed each year is more than 600,000 in the United States. The cost of hysterectomies today is \$5–6 billion per year [37, 38, 50]. After the publication of CREST study in 1982, there have been many reviews on the subject but even though the frequency of the operation increased during this period, indications, route, risks and costs of the operation have grown to be increasingly controversial [12, 13, 16, 26, 29].

We reviewed the hysterectomies performed in our clinic for the last 17 years to reveal the facts in relation to the operation, addressing especially the scope of "unjustified" hysterectomies and the complications.

Materials and methods

A retrospective analysis was undertaken of all women who underwent hysterectomy in İstanbul University Cerrahpaşa School of Medicine Department of Obstetrics and Gynecology between January 1985 and August 2001. The records of the patients who had undergone hysterectomy were reviewed. Age, number of pregnan-

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cies and births and menopausal status were noted as the demographic data. The type of hysterectomy (abdominal, vaginal, subtotal, radical), the indication of the operation, the pathology of the specimen, the duration of preoperative and postoperative hospital stay (days), the incision type, the concurrent procedures to hysterectomy, the duration of operation (minutes), intra-operative and postoperative complications, antibiotic use, and the duration of antibiotic use (days) were retrieved from the records.

The complications were defined as follows: febrile morbidity was defined as oral temperature of 38°C or higher, on two occasions at least 4 h apart and more than 24 h after surgery. Bleeding was divided into intra-operative and postoperative categories. Intra-operative bleeding was defined as bleeding over 200 cc that is requiring blood transfusion during the operation. Postoperative anemia was accepted as hemoglobin level under 10.0 g or lower that is requiring blood transfusion after the operation. Unintended surgical procedures were any laparotomy, repair of a perforated viscus, or repair of a major blood vessel that was performed intra-operatively or postoperatively during the same hospitalization. Life-threatening events were any intra-operative or postoperative cardiac or respiratory arrest, myocardial infarction, pulmonary infarct or embolus, anaphylactic shock, or disseminated intravascular coagulation. Deaths were accepted as related to hysterectomy when it occurred during the operation or within 42 postoperative days due to a complication leading to death.

The data was analyzed in SPSS 10.0 (SPSS Inc. 1989–1999) program. Students' *t*-test and one-way ANOVA test were utilized to compare the data of different hysterectomy groups. The value of $p < 0.05$ was considered as statistically significant.

Results

Between 1985 and 2001, there were 3,956 women who had undergone hysterectomy operation in the Department of Obstetrics and Gynecology of Cerrahpaşa School of Medicine, İstanbul University. There were 3,274 (82.7%) total abdominal hysterectomies (TAH), 424 (10.7%) total vaginal hysterectomies (TVH), 28 (0.7 %) subtotal hysterectomies and 230 (5.8%) radical hysterectomies. Between 1985 and 1989, 626 hysterectomies were performed, and this rate was increased to 1,294 between 1990 and 1994. The rate of hysterectomies was increased to maximum of 1,639 between 1995 and 1999. There were no significant differences in the distribution of hysterectomy type with respect to interval of years (Table 1).

The common indications for hysterectomy were myoma uteri (38.49%), followed by gynecological cancers (21.6%) and uterine prolapse (11.9%) (Table 2).

The rate of concurrent procedures were 87.3% for TAH (2,856/3,274) and 95.8% for TVH (406/424). The

Table 2 The distribution of the hysterectomies according to indications (most frequent indications were noted)

Indication	Number	Percentage
Myoma uteri	1,523	38.49
Uterine prolapse	474	11.9
Endometrial carcinoma	354	8.9
Adnexal mass	367	9.2
Cervical carcinoma	254	6.4
Ovarian carcinoma	248	6.2
Dysfunctional uterine bleeding	184	4.5
Endometrial hyperplasia	98	2.4
Postmenopausal bleeding	72	1.8
Ovarian cyst	60	1.5

Table 3 The comparison of the parameters between TAH and TVH groups

	TAH	TVH
Age (years ± SD)	47.45±8.50	57.13±10.57
Premenopausal (%)	74.8	28.7
Postmenopausal (%)	25.1	71.3
Parity (number ± SD)	2.88±2.10	3.90±2.46
Preoperative stay (days ± SD)	4.36±3.81	4.86±5.67
Postoperative stay (days ± SD)	6.60±3.42	6.65±3.56
Duration of operation (min ± SD)	93.67±41.11	103.77±35.43
Antibiotic use (days ± SD)	2.71±2.71	2.30±2.01

most common concurrent procedure was bilateral salpingo-oophorectomy (BSO) for TAH (1,910/3,274, 58.3%) and anterior and posterior colporrhaphy and Kelly suture for TVH (145/424, 34.1%).

The mean age of the patients was 48.79±8.5 and the median age was 47 years whereas 76.9% of the patients were between 30 and 54 years old. The mean parity was 3.02±2.19 in the overall hysterectomies. In the TAH group 74.8% of women was premenopausal and 25.1% postmenopausal. In the TVH group 28.7% and 71.3% were premenopausal and postmenopausal respectively. The mean parity was 2.88±2.10 and 3.9±2.46 in TAH and TVH group respectively. The average length of preoperative hospital stay was 4.36±3.81 days for TAH and 4.86±5.67 for TVH respectively whereas the average length of postoperative hospital stay was 6.60±3.42 days for TAH and 6.65±3.56 days for TVH respectively. The average duration of the operation was 93.67±41.11 min for TAH and 103.77±35.43 min for TVH. The mean duration of antibiotic administration was 2.71±2.71 days for TAH and 2.3±2.01 days for TVH (Table 3).

Table 1 The distribution of the hysterectomies according to years between 1985 and 2001. NS non significant ($p > 0.05$)

	Total abdominal hysterectomy (TAH)		Total vaginal hysterectomy (TVH)		Subtotal hysterectomy		Radical hysterectomy		Total	<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
1985–1989	508	81.1	73	11.6	11	1.7	34	5.4	626	NS
1990–1994	1,044	80.6	143	11.0	9	0.6	98	7.5	1,294	NS
1995–1999	1,383	84.3	177	10.7	4	0.2	75	4.5	1,639	NS
2000–2001	339	85.3	31	7.8	4	0.1	23	5.7	397	NS
Total	3,274	82.3	424	11.1	28	0.6	230	5.7	3,956	NS

Table 4 The complications of hysterectomy in TAH and TVH groups

Complications	TAH		TVH		Total	
	n	%	n	%	n	%
No complication	2,844	86.5	379	89.3	3,223	87.1
Febrile morbidity (unknown source)	295	9.0	33	7.7	328	8.8
Wound infection	22	0.6	0	0	22	0.5
Urinary infection	16	0.5	7	1.6	23	0.5
Pulmonary infection	8	0.2	0	0	8	0.02
Vaginal cuff infection	5	0.1	1	0.02	6	0.01
Intraoperative bleeding	23	0.6	1	0.02	24	0.6
Postoperative anemia	29	1.1	1	0.02	30	0.8
Ureteral trauma (postoperative diagnosis)	2	0.06	0	0	2	0.005
Vesicovaginal fistula	3	0.06	0	0	3	0.006
Enterocutaneous fistula	2	0.06	0	0	2	0.005
Urinary incontinence	0	0	1	0.002	1	0.003
Death	4	0.1	1	0.002	5	0.01
Total	3,274	100	424	100	3,698	100

Table 5 The complications of hysterectomy in TAH and TVH groups when the indication was 'myoma uteri'

Complications	TAH		TVH	
	n	%	n	%
No complication	1,118	84.7	20	80.0
Febrile morbidity (unknown source)	156	11.8	4	16.0
Wound infection	10	0.8	0	0
Urinary infection	10	0.8	0	0
Pulmonary infection	4	0.4	0	0
Vaginal cuff infection	1	0.1	0	0
Intraoperative bleeding	8	0.6	1	4.0*
Postoperative anemia	7	0.5	0	0
Ureteral trauma (postoperative diagnosis)	1	0.1	0	0
Vesicovaginal fistula	2	0.2	0	0
Enterocutaneous fistula	1	0.1	0	0
Urinary incontinence	0	0	0	0
Death	0	0	0	0
Total	1,320	100	25	100

* $p < 0.05$

The pathological examination of the specimen was normal in 170 cases (5.1%) of TAH. This rate was 42.1% (183/435) in TVH group. The specimen was diagnosed to be normal in 3.7% of the cases that underwent TAH with the indication of myoma uteri (57/1,523) and this rate was 10.8% in the dysfunctional uterine bleeding group (20/184).

The 'unjustified' hysterectomy (the indication of the operation that is not confirmed by the pathological diagnosis of the specimen) was determined in 8.9% of the cases. The rate of unjustified TAH for any indication decreased from 13.3% (64/508) between 1985 and 1989, to 3.3% (35/1,044) between 1990 and 1994 and 2.1% (30/1,383) between 1995 and 1999. Contrary to TAH, the rate of normal pathological specimen increased from 21% (14/64) between 1985 and 1989, to 41.9% (60/143) between 1990 and 1994 and 53.6% (95/177) between 1995 and 1999 ($p < 0.05$).

In the TAH group there was no complication in 86.5% of the cases while it was 89.3% in the TVH group. The

Table 6 The complications of hysterectomy in TAH and TVH groups when the indication was 'prolapsus uteri'

Complications	TAH		TVH	
	n	%	n	%
No complication	65	84.4	294	88.8
Febrile morbidity (unknown source)	11	14.3*	27	8.2
Wound infection	0	0	0	0
Urinary infection	0	0	6	1.8
Pulmonary infection	0	0	0	0
Vaginal cuff infection	0	0	1	0.3
Gastrointestinal infection	0	0	0	0
Intraoperative bleeding	0	0	0	0
Postoperative anemia	1	1.3	1	0.3
Ureteral trauma (postoperative diagnosis)	0	0	0	0
Vesicovaginal fistula	0	0	0	0
Enterocutaneous fistula	0	0	0	0
Urinary incontinence	0	0	1	0.3
Death	0	0	0	0
Total	77	100	331	100

* $p < 0.05$

most common complication was febrile morbidity in the whole group. The incidence of febrile morbidity in TAH group was 9.0% and 7.7% in TVH group. There was no difference in the febrile morbidity rate when we examined the cases according to years (1985–1989: 9.2%, 1995–1999: 21.1%). In TAH group, the incidence of wound infection was 0.6%, intra-operative bleeding requiring transfusion was 0.6% and postoperative anemia was 0.8% (Table 4).

The commonest indication for TAH was 'myoma uteri' and 'prolapsus uteri' for TVH. When the complication rates were compared for these indications in the TAH and TVH groups, febrile morbidity was found significantly higher in TAH group than TVH group when the indication was 'prolapsus uteri' (14.3% for TAH versus 8.2 for TVH). The same is true for intraoperative bleeding when TVH was performed for the indication of 'myoma uteri' (0.6% for TAH vs. 4.0% for TVH; $p < 0.05$); Tables 5, 6).

In last 17 years, a total of 5 deaths that can be attributed to the hysterectomy operation were observed. The mortality rate was calculated as 0.1% for hysterectomy operation in the study period.

Between 1985 and 2001, a total of 28 subtotal hysterectomies were performed. The average age of the patients was 43.93 ± 14.08 . The average parity was 2.75 ± 2.42 . The average length of hospital stay was 4.17 ± 3.72 days preoperatively, 8.96 ± 4.38 days postoperatively. The average duration of operation was 94.44 ± 31.66 min and duration of antibiotic administration was 3.26 ± 2.75 days.

Discussion

According to The Centers for Disease Control statistics data (1988–1990), 1.7 million hysterectomies are performed per year in the United States. Women aged 30 to 54 is the most frequently hysterectomy performed group (100.5/10,000). The hysterectomies for this age group contribute 74% of all hysterectomies [22]. The same distribution was observed in our data also: 76.9% of the patients were between 30–54 years, 1% was younger than 30 years and 22.1% was older than 55 years.

In the United States, the number of hysterectomies performed each year, increased gradually from 306,000 in 1970 to 407,000 in 1980, 549,323 in 1990 and 598,929 in 1997 [18]. The hysterectomy ratio is slightly decreased from 7.1/1,000 to 6.6/1,000 from 1980 to 1987 and this ratio is decreased to 5.5/1,000 in 1993 after new alternative treatments and surgical procedures were identified such as laparoscopically assisted vaginal hysterectomy (LAVH) etc. Likewise, the rate of hysterectomy and the modes of operation did not change throughout the study period in our clinic.

Before LAVH, 75% of hysterectomies were total abdominal hysterectomies and the rest were total vaginal hysterectomies [7]. Total abdominal hysterectomy (TAH) ratio decreased to 39% while total vaginal hysterectomy (TVH) remained the same (29%) after the introduction of LAVH [18]. In 1990, 73% of all hysterectomies were reported as TAH and it dropped to 63% in 1997 whereas the rate of LAVH, which was 0.3% in 1990, increased to 9.9% in 1997 [18]. The rates of TVH did not change significantly (24% to 23%). Historically and today, TVH has been performed less in USA than European countries [10]. In Finland, Makinen et al. reviewed 10,110 hysterectomies that were performed in 1996 and revealed that 17.8% of the hysterectomies were TVH [30]. Cosson et al. reported that 77.9% of the hysterectomies for benign conditions were TVH in their series consisting 1,604 cases in 7 years [9]. The selection of the mode of the hysterectomy seems to be modified by the experience and the familiarity of the surgeon to the procedure rather than the indication. Since LAVH is not performed in our clinic, we did not observe the change in the rate of different modes of hysterectomy.

The debate on LAVH is still continuing in the current literature. According to Richardson et al., “It is a waste of time” whereas randomized studies from Maranaa et al. and Falcone et al. reported its useful benefits and emphasized on the shorter stay in hospital [17, 31, 40]. LAVH has fewer complication rates (hereby note the higher incidence of bladder injury) and long operation time but fast recovery compared to TAH [13, 32]. Supracervical hysterectomy (subtotal hysterectomy) is an alternative to the total abdominal hysterectomy and may be an alternative to LAVH, when the operation is performed via minilaparotomy [43]. It was the most common hysterectomy procedure at 60s and 70s. Supracervical hysterectomy has not done anymore because of the fear of complications that could be arise for the cervix that left in its place, especially the carcinoma of the cervical stump [2, 45]. Today, supracervical hysterectomy has been gaining its popularity with the wider use of cervical smears and application of newer techniques that enables the removal of the transformation zone [24] and also provides easy performance during minilaparotomy, fast recovery; shorter operation time and shorter hospital stay [43]. According to the recent literature, the rate of subtotal hysterectomy has increased from 3,664 (1994) to 11,815 (1997) in USA, which supports the new idea proposed by Jones et al. [2, 23]. At last but not least there are alternative procedures such as endometrial ablation (dysfunctional uterine bleeding) and uterine artery embolization (fibroids) [15, 39, 49]. Seventy-five percent of women may avoid hysterectomy by the use of these techniques [1].

According to National Health Center statistical data (1985), the most common indication for hysterectomy was myoma uteri (26.8%) and this was followed by uterine prolapse (20.8%), endometriosis (14.7%), cancer (10.7%), hyperplasia (6.2%) and others (abnormal vaginal bleeding, menstruation irregularity, parametrial and peritoneal infections, disease of cervix, ovary, tube and postpartum incidents, and other neoplasias (20.7%) [37]. The mean and median ages for hysterectomy were slightly higher in our clinic (48.79 and 47 years respectively). The most frequent indication was leiomyoma (38.49%) and uterine prolapse (11.9%) in our series.

In 1946, Miller reported that there were 33.1% misdiagnoses for performing hysterectomy operations and 31% of hysterectomy specimens showed no abnormality after pathological examinations [33]. Ojeda found that the rate of normal specimen was 9% and 15% in TAH and TVH groups, respectively [36]. Foster reported that 16.9% of 485 uteri removed were considered normal anatomically [20]. According to Atkinson and Chappell's study, 81% of the uteri were normal for the vaginal hysterectomies that were done for sterilization purposes and Hibbard reported this ratio as 94% [4, 21]. In our series, the pathological examination of the specimen was normal in 170 cases (5.1%) of TAH cases. This rate was 42.1% in TVH group as expected since it was mainly performed for uterine prolapse in the postmenopausal period.

This controversy still exists as noted in the study of Broder et al., which indicated the inappropriate misuse or overuse of hysterectomy in the current practice [6]. Doyle reported 39% of hysterectomies were unnecessary [14]. Trussel et al. reported that more than 30% of hysterectomies were unnecessary in 1962 [47]. Fine and Morehead reported that 43% of hysterectomies were unjustified [19]. After postoperative pathological examination of hysterectomy specimen, 80% of the preoperative diagnoses were confirmed [19]. In the systematic review of the literature, Meikle et al., stated that 36% of the hysterectomy specimens had no pathological diagnosis. The authors concluded that this finding could be reflecting the doctor or patient driven, otherwise probably “unjustified” indications [32]. The pathological confirmation rate decreased to 48% among the hysterectomies that were done for menstruation irregularities, pelvic pain and pelvic relaxation [5]. According to our data, the specimen was diagnosed to be normal in 3.7% of the cases that underwent TAH with the indication of myoma uteri (57/1,523) and 10.1% of cases of dysfunctional uterine bleeding. Fifteen percent of radical hysterectomies did not appear to have cancer [44]. Contrary to the literature, in our series, some kind of irregularity was noted in all of the specimens of the hysterectomies that were performed for the indication of pelvic pain. The decrease in the rate of unnecessary TAH operation and the increase in the normal specimen in TVH operation can be attributed to the increase in the use of ultrasound in the diagnosis of pelvic problems and the progress in the ultrasound technology and the expertise gained throughout the years as well. After all, unnecessary hysterectomies fail to get the preferred results and cause the development of pain, depression, and dyspareunia in 6.6% of the patients [25]. Posthysterectomy minor symptoms that were recently reported by DeCherney et al., should be considered in the debate of unnecessary hysterectomies (fatigue 74%, pain 63%, difficulties in concentration 42% and depression 37%) [11].

The overall complication rate of TAH was reported as 42.8% whereas it was 24.5% for TVH in the CREST study in 1982 [50]. Using the similar criteria, these rates were reported as 44.0% and 27.3% for TAH and TVH, respectively in 2001 [48]. Relatively lower complication rates were reported from Europe: 23.3% for TVH and 17.1 for TAH [30], 3% for TVH and 10.8% for TAH [8] and 34% for TAH and 24% for TVH [9]. The methodology to assess the complication rates between the different types of hysterectomy is still misused [34]. In our series, we determined lower complication rates (13.5% for TAH and 10.7% for TVH). This difference is probably because of the different criteria to assess the complication rates. The most common complication was febrile morbidity in all of these studies including our series. The rate of febrile morbidity did not change during the study period despite the wider use of the prophylactic antibiotics. The rate of the other complications, especially the unintended injuries to the adjacent organs were below 1%. In our study, we observed 5 deaths (4 following TAH and 1 following

TVH) in 17-year period, this equals to 13.5 deaths per 10,000 hysterectomy procedures. This rate is similar to the data of the literature [3, 27, 28, 35, 51]. One interesting finding of our study is the unexpectedly higher rate of febrile morbidity in TAH group when the indication was ‘prolapsus uteri’ and the same is true for the higher rate of intraoperative bleeding when TVH was performed for ‘myoma uteri’. The overall complication rate (including the deaths attributable to hysterectomy) enables hysterectomy to be noted as a ‘safe’ surgical procedure—but this complication rates can be agreed to be reasonable only when the operation is performed for the “justified” indications using the appropriate route for the indication.

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