

Total Versus Subtotal Hysterectomy for Benign Uterine Disease: Which Advantages

francesca federici (✉ dott.francescafederici@gmail.com)

Ospedale Sant'Andrea <https://orcid.org/0000-0002-2446-5262>

Benvenga Greta

Azienda Ospedaliera Sant'Andrea

Polimeno Teresa

Azienda Ospedaliera Sant'Andrea

Renzulli Federica

Azienda Ospedaliera Sant'Andrea

Turchiano Francesca

Azienda Ospedaliera Sant'Andrea

Vitiello Francesca

Azienda Ospedaliera Sant'Andrea

Costanzi Flavia

Azienda Ospedaliera Sant'Andrea

De Marco Maria Paola

Azienda Ospedaliera Sant'Andrea

Assorgi Chiara

Azienda Ospedaliera Sant'Andrea

Ruscito Ilary

Azienda Ospedaliera Sant'Andrea

Caserta Donatella

Azienda Ospedaliera Sant'Andrea

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Abstract

BACKGROUND: to evaluate the impact of total vs subtotal hysterectomy on vaginal bleeding and intestinal, sexual and bladder dysfunction.

METHODS: observational study conducted on women who underwent hysterectomy for benign uterine disease at S. Andrea university hospital in Rome between July 2013 and December 2017.

We selected 236 women that underwent hysterectomy for benign disease to submit a validated questionnaire during the follow up evaluation at 12 months from the surgery. One hundred and sixty-two accepted to answer (84 subtotal hysterectomy, 78 total hysterectomy).

RESULTS: Twenty-one percent (n=18) of subtotal hysterectomy (SAH) and eight percent (n=6) of total (TAH) showed vaginal bleeding (p=0,015). The difference was not statistically significant for pelvic pain, nausea, alvus changes and urinary incontinence.

Thirteen percent (n=10) of women subjected to subtotal hysterectomy and twenty-nine percent (n=21) of the totals has declared to experience pain during sexual intercourse (p=0,0159). Thirty-one percent (n=22) of TAH noted a deterioration in the quality of sex intercourses (p=0.026).

Concomitant bilateral salpingo-ovariectomy, compared to salpingectomy alone, resulted in an increase in sexual dysfunction for all the analyzed outcomes with a statistically significant difference in the group of total hysterectomies (perception of pain during intercourse [p=0,029], worse quality [p=0,015] and altered vaginal length [p=0,003]).

CONCLUSION: SAH is superior to TAH in terms of sexual function but is related to more vaginal bleeding. There are no differences between the groups regarding bowel and bladder function and the development of other symptoms after surgery. For these reasons the type of surgery should be decided by the patient after accurate medical counselling, minimizing, the incidence of salpingo-ovariectomy associated with hysterectomy.

Introduction

Although in recent years the use of hysterectomy for the treatment of gynecological disease has decreased, this intervention is still frequent today, being the main gynecological operation performed in

Europe, in the United Kingdom and in the USA. [1].

Seventy-five percent of these surgical interventions are performed abdominally.

Most hysterectomies are "total" procedures that include removal of the cervix. With the increased efficacy of

screening tests for the control of cervical pathology, the interest in "supra-cervical" or "subtotal" procedures

has increased. There is not proven benefit to prefer subtotal with total hysterectomy, so the preservation of cervix is already at the center of scientific debate.

While subtotal hysterectomy seems to have less surgical complications, long term effect as pelvic organ prolapse, sexual, urinary and bowel disorders, don't appear to be different [2–4].

We have therefore conducted this observational study in order to evaluate the real benefits of

subtotal hysterectomy (SCH) compared to total (TAH). In particular, the aim of the study was to assess the

impact of the type of surgery on vaginal bleeding, on the urinary tract, the gastroenteric system and the sexual sphere.

Material And Methods

Between July 2013 and December 2017, 372 patients underwent abdominal hysterectomy at the Department of Medical and Gynecology unit, Sant'Andrea University Hospital, Sapienza University of Rome, Italy: 128 underwent subtotal hysterectomy and 244 a total hysterectomy. Exclusion criteria were an age over than 55 years, malignant disease and endometriosis.

136 women were excluded because they did not meet inclusion criteria, 122 from the

group of total hysterectomies and 14 from the group of subtotals. Patient underwent clinic exam after 1 year from the surgery.

The women included in the study were therefore 236. Seventy-four patients have been excluded from analysis: 63 patients were untraceable, 11 refused to participate. Questionnaire was submitted to 84 for subtotal hysterectomy and 78 for total hysterectomy.

The data were collected through a validated questionnaire used in other follow up [3, 5] submitted to the patients during the visit of follow up of 12 months.

Informed consent to the study and to process personal data, has been collected.

The questionnaire includes questions about vaginal bleeding after surgery, bowel function, urinary disorders, other symptoms as pain, quality of the sexual life and quality of life, assessed by the validated SF-36 questionnaire.

Surgeons performed hysterectomy according to the preferred technique. Prophylactic salpingectomy was performed on all the patients. In case of concomitant ovary disease, bilateral/monolateral salpingo-ovariectomy was performed.

Patients were subjected to antibiotic prophylaxis with 2 g of cefazolin and 500 mg of metronidazole intravenously. In case of allergy to penicillin the antibiotic prophylaxis most suitable for the single patient has been assessed. Bowel preparation was performed with evacuative enema and polyethylene glycol.

It should also be emphasized that no univocal, predetermined procedures have been followed for the type of

anesthesia used; for endocervical removal or ablation of tissue in the group of supracervical hysterectomies.

for procedures including the suspension of the cervix and the treatment on the adnexa; for wound closure techniques and for postoperative management of intestinal and urinary function.

The impact of bilateral salpingo-ovariectomy compared to salpingectomy alone, on the above-mentioned outcomes, has also been analyzed.

Finally, the participation in screening programs has been investigated.

Data were expressed as mean \pm SD (standard deviation).

Comparisons between groups were performed with the exact Fisher test at two queues.

The values were considered statistically significant when $p < 0.05$.

The accuracy of the OR has been estimated with a confidence interval of 95% (CI). Large CI indicates a low

level of accuracy of the OR, restricted CI Indicates a higher accuracy of the OR.

Results

We contacted 236 women for the follow up visit after 12 months: 63 patients were untraceable; 11 patients refuse to participate. Questionnaire was submitted to 162 patients: 78 underwent Total

Abdominal Hysterectomy and 84 underwent Subtotal Abdominal hysterectomy, the number of participants of the group was similar (48% vs 52% respectively).

Patients characteristics not differ among the two study groups on the mean age (46.5 ± 4.3 DS for SAH group vs 48 ± 4.1 DS for the TAH group) smoke, dietary habits, alvus and diuresis .

Indication for surgery of women who underwent SAH compared with women who underwent TAH did not differ significantly: the main indications for surgery were uterine fibromatosis (both diffuse and multiple leiomyomas and single myoma) and metrorrhagia, resistant to medical therapy, associated or not with anemia. In the SAH group bilateral salpingo-ovariectomy was performed in 9 patients, bilateral salpingectomy in 72 patients, 3 patients underwent different treatments on the adnexa for concomitant ovarian pathology or for previous surgery. In the TAH group, bilateral salpingo-ovariectomy was performed in 26 patients, bilateral salpingectomy in 45 patients, 7 patients were subjected to different treatments for concomitant ovarian pathology or for past surgery. More patients in SAH group (21%, 18 of 84) than in TAH group (8%, 6 of 78) reported vaginal bleeding after 3 months ($p = 0,015$) (Table 1). During the first three months after surgery, vaginal bleeding occurred in 25% ($n = 21$) of the subtotal hysterectomies and in 13% ($n = 10$) of total hysterectomies, but the difference was not statistically significant ($p = 0,071$). Vaginal bleeding in patients undergoing subtotal hysterectomy resulted in a low amount (89%, $n = 16$), at regular intervals (61%, $n = 11$) and of prolonged duration (72%, $n = 13$).

Table 1
Main outcomes based on the type of surgery. Values are expressed as N (%). *Statistically significant.

| Outcome | TAH N = 78 (%) | SAH N = 84 (%) | OR 95% CI | p value |
|-----------------------------|----------------------|----------------------|-----------------------|---------|
| Vaginal bleeding | 10 (13) | 21 (25) | 2,27 | 0,071 |
| - 3 months | 6 (8) | 18 (21) | (0,99 – 5,18) | 0,015* |
| - after 3 months | | | 3,27 (1,23 – 8,74) | |
| Pain | 9 (12) | 12 (14) | 1,28 (0,51 – 3,22) | 0,646 |
| Nausea | 1 (1) | 0 (0) | | 0,481 |
| Alvus Changes | 8 (10) | 7 (8) | 0,8 (0,27 – 2,31) | 0,788 |
| Urinary Incontinence | 12 (15) | 11 (13) | 0,83 (0,34 – 2) | 0,822 |
| Sexual Function | 21 (29) | 10 (13) | 0,36 | 0,015* |
| - pain | 67 (69) | 50(86) | (0,15 – 0,82) | 0,026* |
| - quality: same/better | 22(31) | 11 (14) | 0,37 | 0,073 |
| worse | 16 (22) | 8 (10) | (0,17 – 0,84) | |
| - altered vaginal lenght | | | 0,4 (0,16 – 1) | |
| Pap test | 38 (49) | 65 (77) | 3,6 (1,83 – 7,09) | 0,0002* |

Analysis of other data as post-operative pelvic pain(p = 0,646), nausea experience(p = 0,481), alvus changes as constipation (p = 0,788), vaginal dryness and hypoesthesia of the suture (p = 0,455) showed no significant differences between the two surgical groups. No significant difference was found regarding urinary incontinence:13%(n = 11) of patients underwent SAH and 15% (n = 12) underwent TAH, reported UI(p = 0,822). In particular, in the SAH group 91% (n = 10) of UI referred to stress incontinence and 9% (n = 1) mixed-type incontinence while in the TAH group 58% (n = 7) presented stress incontinence, 25% (n = 3) urgency incontinence and 17% (n = 2) mixed incontinence.

There wasn't an improvement in UI after surgery: in the SAH group 3 patients reported that urinary incontinence was already present before surgery and found no benefit after the surgical procedure; in TAH group, however, one patient noticed an improvement of the symptoms after the operation. All the other patients did not present urinary symptoms at the medical examination before the surgery.

Regarding sexuality, in the SAH group 5 women no longer had intercourse after surgery and one patient was virgo, in the TAH group 6 women did not have a partner and stated they did not know whether they were satisfied with their sex life.

Less women undergoing subtotal hysterectomy (10 women, 30%) claimed to experience pain during sexual intercourse than women underwent total hysterectomy (21 women, 29% and the difference between the two groups was statistically significant ($p = 0,0159$).

In patients undergoing TAH surgery caused significant a negative impact ($p = 0.026$) on the quality of sexuality in 31% of women compared with 14% of the SAH group.

There were no differences regarding changes in vaginal length as sense of restriction or shortening, ($p = 0,073$).

Given the well-known impact of estrogenic deficiency on sexual function, we have analyzed, among our patients, the role of salpingo-ovariectomy in the development of alterations in sexual function. Among patients underwent subtotal hysterectomy, a greater proportion of disturbances were detected among those who underwent bilateral salpingo-ovariectomy compared to salpingectomy alone. The same result emerged in the analysis of total hysterectomies data.

About Pap-test execution after surgery, 77% ($n = 65$) of patients underwent subtotal hysterectomy did a cytologic examination, while only 49% ($n = 38$) of the TAH group did a smear of the vaginal vault. The difference between the two groups is statistically significant ($p = 0,0002$).

Discussion

For many years the scientific literature has debated on the risks and benefits of these two surgical techniques.

Most of the visceral and hemorrhagic complications of hysterectomy appear to occur during, or as result, of the removal of the cervix during the procedure [3]

The benefits of total hysterectomy mainly concern the elimination of the risk of cancer, of bleeding and of pelvic pain linked to the maintenance of the cervix [2, 22].

The risk of cervical cancer in patients undergoing subtotal hysterectomy is not supported by scientific

evidence but for example a retrospective series [14] reported a risk of complications of the cervical stump and subsequent trachelectomy calculated up to 22%. There are several techniques for the ablation of the endocervical canal during subtotal hysterectomy, but there are no comparative studies to help surgeons understand which is the most effective. So, this topic needs further studies [7].

All the patients with an history of positive Pap-test or Hpv Dna test, should undergo total hysterectomy or should be strictly checked after surgery. It is necessary that patients understand the importance of respecting the screening program after surgery.

In our study, more women who underwent a subtotal hysterectomy regularly did PAP-test after surgery compared with women underwent total hysterectomy, only 49% (n = 38) continued cytologic exams of the vaginal vault.

It is important to underline, however, that the USPSTF guidelines of 2003 and 2012 recommended not to perform pap-test in women who underwent total hysterectomy for benign indications, since, although it is recognized that they could still develop a vaginal tumor, this is rare, so screening is not indicated [24].

In subtotal hysterectomy persistent bleeding is usually related to the remaining endometrium left during the

procedure, endometriosis and adenomyosis. In total hysterectomy vaginal bleeding is usually due to atrophic

vaginitis, vaginal vault granulation, endometriosis of the vault, cervical stump cancer, infiltrating ovarian tumors, estrogen secreting tumors in other parts of the body and rarely carcinoma of the fallopian [26].

Regarding this symptom, the incidence of post - supracervical hysterectomy bleeding is reported between 1

and 25% in literature, including abdominal and laparoscopic techniques [7] and numerous studies emphasize

how this increased significantly with subtotal hysterectomy compared to total [2, 6, 5, 17].

These data are confirmed in our study, in fact, in the months following surgery, the bleeding occurred in 21% (n = 18) of the subtotal hysterectomies and in 8% (n = 6) of the total and the difference was statistically significant (p = 0,015). The strength of the association is also supported by the value of the odds ratio and the wide confidence interval.

In favor of subtotal hysterectomy, however, a lower duration of the surgical act, less intra (bleeding) and postoperative complications and a shorter hospitalization, are globally recognized [2, 17].

Most of these differences can be applied mainly to the laparotomic approach and have not been demonstrated

in laparoscopy.

There are some controversies in the scientific world regarding the consequences of the removal/maintenance

of the cervix on intestinal, sexual, urinary function and on the possibility of developing pelvic prolapses.

Some argue that, maintaining the support structures of the uterus and the vagina (cardinal and uterosacral ligaments) and causing less damage to nerves that innervate the vagina, bladder and intestines, it is possible that subtotal hysterectomy may cause less intestinal, urinary and sexual dysfunction.

About intestinal function, few data are present in literature. A prospective multicentric study of Roovers et al. [10] reports increased disturbances in the subtotal group but other studies underline non-significant differences between the two types of hysterectomy [8, 9] in accord with what emerges from our work, in which the alvus changes, manifested mainly in the form of constipation, weren't significantly different between the two groups ($p = 0,788$).

From a study by Brown et al. [13] the chances of developing urinary incontinence after hysterectomy are about 40% higher than in women who have not undergone hysterectomy. Conflicting results however emerge from the analysis of the disorders in the different groups of patients.

Both the sympathetic and parasympathetic innervation reach the bladder through the pelvic plexus, the cardinal ligament and, subsequently, the Frankenhauser plexus, as a result, the innervation is potentially susceptible to secondary damage due to the paracervical dissection associated with total hysterectomy [6].

Moreover, subtotal hysterectomy has the theoretical advantage of not damaging the pelvic floor support [19].

A meta-analysis conducted by Robert et al. [19] showed no statistically significant differences in the risk of

developing urinary incontinence (both stress and urgency) in women who underwent supracervical

hysterectomy compared to women undergoing total abdominal hysterectomy. However, it has emerged that

all urinary symptoms are improved by hysterectomy.

Conflicting results emerged from a study of Gimbel et al of 2003 [17] in which, women underwent total hysterectomy, less developed urinary incontinence compared to the subtotal.

Considering that it could take years for developing urinary incontinence after pelvic trauma, both neurological and anatomic, Greer et al. [7] assessed, in a multi-center study, urinary outcomes 9 years after hysterectomy and it revealed that participants continue to experience improvements and that there is no greater benefit of performing a subtotal hysterectomy than a total one, in the development of urinary symptoms.

From our data can be detected that 13% of patients undergoing subtotal hysterectomy and 15% of the total

complained of urinary incontinence, mainly in the form of stress incontinence (91% SCH and 58% TAH).

However, the difference between the two groups is not statistically significant ($P = 0,822$), so, the type of intervention does not impact on the development of urinary incontinence, as in Robert et al's study. [19].

About the increased risk of developing prolapse, the most recent literature does not detect statistically significant differences between the groups, in contrast to what was previously asserted [2, 7].

The main problem of evaluation concerns the fact that prolapse, as previously emphasized with urinary symptoms, may appear even years after hysterectomy and studies with long-term follow-up would be required to assess whether the preservation of the cervix is translated into a better support of the vaginal vault [2]. As a retrospective study carried out through a telephone survey, it was not possible to significantly

measure the real development of prolapse among our patients.

In the context of sexual disorders some studies have reported that women undergoing partial hysterectomy

have a better function and sexual satisfaction than those subjected to total hysterectomy [11, 16]. However,

different results have emerged from three prospective studies, and a retrospective one, in which there were no differences between the groups. In these studies, the perceived sexual function improved after hysterectomy independently of the technique [1, 8, 9, 10, 12, 23].

In two randomized clinical trials of Asnafi et al. [15] and Gimbel et al. (2003) [17], however, no improvement of dyspareunia was detected before and after surgery, while confirming the non-superiority of one technique over the other in post-hysterectomy sexual function disorders.

In our telephone interview, patients reported an improvement of pain and quality of intercourse in subtotal hysterectomies compared to total with a statistically significant difference ($p = 0,0159$ and $p = 0.026$).

It is important, however, to emphasize that the main dysfunctions of sex life are due to the estrogenic deficiency consequent to the removal of the ovaries.

Bilateral salpingo-ovariectomy is a preventive strategy to reduce the risk of epithelial ovarian cancer in women with a familiar history of ovarian carcinoma (BRCA1 or BRCA2 mutation carriers) after the completion of family project. The procedure drastically reduces the incidence of this pathology [25].

However, an ovariectomy in premenopausal women will induce menopause, which, in addition to the symptoms of estradiol reduction (hot flashes and changes in sexual function), confers increased risk of cardiovascular morbidity and osteoporosis (fractures) [26].

We have therefore decided to analyze the impact of salpingo-ovariectomy on our patients. Among the patients underwent subtotal hysterectomy, although a worsening of the quality of intercourses and the perception of pain and/or the sensation of a tight or shortened vagina wasn't detected, a percentage increase of disturbance was underlined among bilateral salpingo-ovariectomy compared to salpingectomy alone. However, the difference between the two groups is not statistically significant, which can be ascribed to the small sample of salpingo-ovariectomy performed in subtotal hysterectomies.

Also, in the group of total hysterectomies, there has been an increased proportion of disorders in patients who underwent salpingo-ovariectomy compared with salpingectomy. In this case, however, the difference between the two groups is statistically significant.

Therefore, from our study, as in literature, emerges that, for premenopausal women without a family history

of ovarian carcinoma, the benefits of an oophorectomy at the time of hysterectomy for a benign indication

seem not to exceed the risks [27, 28], so, this procedure seems to be not recommended.

In general, our patients showed an improvement in the quality of life after the hysterectomy. As the review of Lethaby, et al. [2] emphasizes, in fact, in most studies, the quality of life is improved as a result of the operation, regardless of the type of surgery.

However Munro, et al. underlined the possibility that the subtotal hysterectomy technique type performed has an impact on the result. For example, variations in the management of the cervical canal may have an impact on the future incidence of cervical cancer, or the degree of dissection of uterine vessels can influence the frequency and type of surgical complications. As a result, it may be useful to consider a classification system of subtotal hysterectomies when designing clinical evaluation studies of supracervical hysterectomies [3].

In conclusion, subtotal hysterectomy was superior to total hysterectomy for the improvement of sexual function, but it is more related to vaginal bleeding. There are no differences between the groups about intestinal function, bladder function and the development of other symptoms after surgery.

What emerges from our study is in agreement with other previous works [20],

independently of the techniques, hysterectomy leads to a substantial reduction of the main symptoms.

An important consideration is that hysterectomy is performed to improve quality of life rather than to treat

potentially lethal conditions. In fact, the most common indications are severe or irregular uterine bleeding, uterine myomas and pelvic pain [1].

Although it is therefore benign pathology, a poll performed among American gynecologists in 2003 [18] revealed that only 19.1% routinely offered their patients a choice between removal and preservation of the cervix, and even less (17.8%) informed patients about the potential benefits and risks of both procedures.

For these reasons, the American College of Obstetricians and Gynecologists [21] stressed, in a consensus opinion, that subtotal hysterectomy should not be recommended by the surgeon as superior to total hysterectomy for benign diseases, and that women elected for surgery should therefore receive information

based on scientific data so that they can make a conscious choice, having an important role in the decisionmaking process.

Limitations

the main limitation of the study is sample size, however, there are no significant differences in the demographic characteristics of the study groups which are therefore homologous.

The second limitation is the lack of assessment of the quality of life before the surgery.

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Declarations

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and

its later amendments or comparable ethical standards. This article does not contain any studies with animals

performed by any of the authors.

Consent for publication

Not applicable

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

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Author's contribution

DC: conceived the study, designed the study, reviewed and revised the manuscript critically. RI and AC reviewed and revised the manuscript critically. FF, BG, PT, RF, TF, VF: carried out the literature search and data extraction, interpreted the result of the analysis, reviewed and revised the manuscript critically.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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