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A prospective study on the effects of total abdominal intrafascial hysterectomy for benign indications on patients' pelvic floor functions

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ABSTRACT

Objective: The aim of this study was to evaluate the effects of total abdominal intrafascial hysterectomy operations performed for benign indications on patients' pelvic floor functions at the 3rd and 6th months postoperatively.

Materials and Methods: This study was conducted between May 2022 and November 2022 at the Obstetrics and Gynecology Clinic of Muğla Sıtkı Koçman University Training and Research Hospital. A total of 50 patients who underwent total abdominal intrafascial hysterectomy for benign indications were included in the study. The patients were administered the pelvic floor distress inventory-20 (PFDI-20) which includes pelvic organ prolapse distress inventory-6 (POPDI-6), urinary distress inventory-6 (UDI-6) and colorectal-anal distress inventory-8 (CRADI-8) questionnaires both before the operation and at the 3rd and 6th months postoperatively.

Results: In the study investigating the effects of the total abdominal intrafascial hysterectomy technique on the pelvic floor functions of the patients, there was a statistically significant decrease in the POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores at the 3rd month postoperatively compared to the preoperative period ($p<0.001$ for all). At the 6th month postoperatively, there was also a statistically significant reduction in POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores compared to the preoperative period ($p<0.001$, $p=0.001$, $p<0.001$, $p<0.001$, respectively). A significant positive correlation was found between patients' body mass index and PFDI-20 scores.

Conclusion: After total abdominal hysterectomy operations performed using the intrafascial technique, a significant decrease in PFDI-20 scores was observed compared to preoperative scores. When hysterectomy operations are performed using the intrafascial technique, it preserves the pelvic floor functions due to the protective nature of the fascia, ligaments, muscles, and nerves.

Keywords: Cystocele; enterocele; pelvic floor; posterior syndrome; rectocele; urinary stress incontinence

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INTRODUCTION

Common pelvic floor problems, while not life-threatening, affect psychological, social, and physical well-being, leading to limitations in a woman's work, family, and sexual life, thereby negatively impacting her quality of life. Therefore, treating pelvic floor dysfunction (PFD) will address not only the physical aspects of the problem but also its social and psychological dimensions. For this reason, understanding the pelvic floor correctly is crucial for grasping the problem accurately and applying the appropriate treatment method.[1]

The pelvic organs -rectum, vagina, and bladder-lack a natural shape or resistance. Ligaments, muscles, and fascias form a musculo-elastic system that gives shape and function to the pelvic floor organs. These organs have functions such as urination, defecation, and coitus.[2] Peter E. Papa Petros proposed the integral theory" which approaches the pelvic floor as a whole.[3] According to the "integral theory", the normal functioning of pelvic floor structures requires the presence of normal anatomical components such as bones, muscles, ligaments, and fasciae, along with the healthy functioning of the central and peripheral nervous systems that innervate these structures. PFD is often associated with pelvic organ prolapse (POP), urinary incontinence, urination-defecation issues, sexual problems, and chronic pain. Studies have also shown that hysterectomy operations negatively impact pelvic floor functions.

Hysterectomy, one of the oldest surgical procedures dating back to the 1840s, is currently one of the most frequently performed gynecological operations. Since most hysterectomies are performed to improve the quality of life rather than to address life-threatening conditions, it is understandable that the associated morbidities should be emphasized. Hysterectomy is considered a safe procedure with a mortality rate of less than 0.1%.[4,5]

Clinicians have long suspected a link between hysterectomy and PFD, but despite decades of research, this remains a highly debated topic.[6-8] One reason for the debate is that the literature is filled with conflicting studies that complicate the determination of whether a connection truly exists. Post-hysterectomy PFD has been associated with nerve damage; however, this is often overlooked in the context of simple hysterectomy because the pelvic somatic nerves are located too laterally, and patients typically do not present classic symptoms of autonomic nerve damage. Traditional beliefs suggest that pelvic autonomic nerve damage manifests as bladder and bowel dysfunction, such as urinary urgency and fecal incontinence. However, recent literature indicates that smooth muscle also plays a role in the musculo-fascial support of the pelvic floor, supporting the likelihood that autonomic damage may present in more varied ways than previously believed.[9,10] Additionally, the risk of autonomic nerve injury is higher than its somatic counterparts, as they run medially along the surgical planes of hysterectomy around the cervix. Thus, there is a risk of autonomic nerve damage during hysterectomy procedures. While there are studies indicating that non-intrafascial (extrafascial hysterectomy, radical hysterectomy, etc.) hysterectomy operations do not lead to PFD, many studies exist that demonstrate they can cause PFD.[11,12]

We planned this study to investigate the hypothesis that intrafascial hysterectomy operations, unlike extrafascial hysterectomy operations, do not lead to PFD due to the preservation of pelvic anatomical structures (fasciae, ligaments, muscles, etc.) and peripheral nerve fibers.

MATERIALS AND METHODS

All processes related to this thesis study were approved by the Clinical Research Ethics Committee of Muğla Sıtkı Koçman University Rectorate on May 11, 2022, with decision number 9/XI. All procedures conducted in the study adhered to the ethical standards of the Institutional and/or National Research Committee and complied with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Patients scheduled for total abdominal intrafascial hysterectomy for benign indications in our clinic were informed about the study's purpose and design. Those who volunteered to participate were included in the study after obtaining written informed consent. Preoperative cervical cytological screenings were performed on the patients. Patients planned for vaginal hysterectomy, total laparoscopic hysterectomy, those with malignant indications, those with urinary tract infections, those with known neurological diseases (such as multiple sclerosis), and those who had previously undergone pelvic floor surgery, such as surgery for POP or urinary system procedures, were excluded from the study. Patients who sustained urinary or gastrointestinal system injuries during the intrafascial hysterectomy were also excluded from the study. Information on volunteers' age, body mass index (BMI), obstetric history, medical history, previous surgeries, indication for hysterectomy, and preoperative complete blood count and biochemical values was recorded. Standard anesthesia was applied to all volunteers. All volunteers underwent standard laparotomic hysterectomy (total abdominal intrafascial hysterectomy). A Foley catheter was placed in the bladder before the operation and removed on the first postoperative day. Volunteers were evaluated using prepared survey forms [(pelvic floor distress inventory-20 (PFDI-20)] before the operation and at the 3rd and 6th months postoperatively.

The PFDI-20 consists of 20 questions and is a scale rated at level A for the assessment of PFD by the International Consultation on Incontinence group.[12]

Surgical Technique

Intrafascial hysterectomy is a procedure in which the cervix is removed while preserving the uterosacral ligaments. The hysterectomy begins with the cutting of the round ligament. The posterior peritoneum is then incised parallel to the infundibulopelvic ligament. If the adnexa are to be removed, the infundibulopelvic ligament is cut; if not, the utero-ovarian ligament is severed. Subsequently, the anterior peritoneum is dissected from lateral to medial to allow for bladder mobilization.

To confirm the uterine artery, the uterus is pulled upward using forceps for safe preparation, and the connective tissue around the cervix is cut with lateral traction of the peritoneum. While the original Aldridge procedure involves directly clamping the parametrial tissue beneath the internal cervical os, Noda's method places the parametrial clamps at the mid-position between the internal and external cervical os. Additionally, when the parametrial tissue, including the longitudinal muscle layer of the uterine cervix, is appropriately clamped, it facilitates the intrafascial approach.

Bilateral parametrial tissues are cut with scissors, including a part of the longitudinal muscle layer of the cervix, and then sutured with slowly absorbable suture material. After the bilateral parametrial tissues are secured, the bladder is checked to ensure that it is properly dissected beneath the position where the parametrial tissue was secured. With adequate traction on the uterus, the ends of the cut longitudinal muscle layer of the cervix are brought together using a scalpel or electrocautery. The uterus is gradually retracted by cutting the longitudinal muscle layer, especially as the uterosacral ligament is severed, with the uterus being clearly mobilized. When the intrafascial approach is performed properly, the vaginal canal opens spontaneously. It is important to confirm that the uterine cervix has been completely removed and to grasp the vaginal canal, including the vaginal mucosa, using long forceps. After sterilization and ensuring hemostasis at the vaginal stump, the vaginal cuff is closed with slowly absorbable sutures.

As can be seen, we conducted this study based on the hypothesis that the intrafascial hysterectomy technique, which preserves fasciae, ligaments, and nerves, will not lead to PFD.

Statistical Analysis

A power analysis performed using G*Power 3.1 software indicated a total sample size of 41, with a power of 0.99 and an effect size of 0.63. Considering potential volunteer dropouts during the study duration, 50 volunteers were included in the study.

Statistical analysis of the data was performed using the SPSS (Statistical Package for the Social Sciences) version 25.0 software. Categorical measurements were summarized as counts and percentages, while continuous measurements were summarized as means and standard deviations (with median and minimum-maximum values reported where appropriate). The Kolmogorov-Smirnov test was used to determine whether the parameters in the study exhibited a normal distribution. For parameters that did not show a normal distribution, the Wilcoxon signed-rank test was used for binary group analyses. For parameters that exhibited a normal distribution, the Dependent Samples t-test was used for binary group analyses. A statistical significance level of $p<0.05$ was accepted for all tests.

RESULTS

A total of 50 volunteers who underwent total abdominal intrafascial hysterectomy for benign gynecological indications were included in our study, which was planned as a prospective cohort study. The average age of the patients was 48.8±7 (range: 36-76) years, while the mean preoperative BMI was recorded as 29.2±5 (range: 20.4-48.8) kg/m². The median gravidity history of the patients was 2.5 (mean: 3.1), the median history of normal vaginal delivery was 1.5 (mean: 1.5), and the median history of cesarean delivery was 0 (mean: 0.9). The demographic characteristics of the patients are presented in Table 1.

The indications for surgery in the patients were as follows: uterine fibroids (17.34%), uterine fibroids + atypical hyperplasia (17.34%), simple atypical endometrial hyperplasia (4.8%), myomatous uterus (2.4%), uterine fibroids + pelvic mass (2.4%), myomatous uterus + atypical hyperplasia (2.4%), uterine fibroids + adenomyosis (1.2%), uterine fibroids + adnexal mass (1.2%), uterine fibroids + pelvic inflammatory disease + pyosalpinx (1.2%), postmenopausal endometrial thickness increase + cancer phobia (1.2%), atypical hyperplasia + adnexal mass (1.2%), and postmenopausal adnexal mass (1.2%). The patients' BMI showed a decrease at the 3rd month postoperative compared to the preoperative period. The BMI change graph is presented in Figure 1.

The patients' preoperative pelvic organ prolapse distress inventory-6 (POPDI-6), colorectal-anal distress inventory-8 (CRADI-8), urinary distress inventory-6 (UDI-6) and PFDI-20 scores were compared with the postoperative 3-month scores, the preoperative scores with the postoperative 6-month scores, and the postoperative 3-month scores with the postoperative 6-month scores. The patients' preoperative POPDI-6 median

Table 1. Demographic characteristics of the patients					
	Mean	**Standard deviation**	**Median**	**Minimum**	**Maximum**
Age (year)	48.8	7	47	36	76
Pre-operative BMI (kg/m^2)	29.2	5	29.1	20.4	48.8
Post-operative BMI at 3 months (kg/m^2)	28.8	5	28.6	20.8	46.8
Post-operative BMI at 3 months (kg/m^2)	29.1	5	29	21.1	47.6
Gravidity (n)	3.1	2.2	2.5	0	11
Vaginal delivery (n)	1.5	1.8	1.5	0	7
Cesarean section (n)	0.9	1.1	0	0	5

BMI: Body mass index

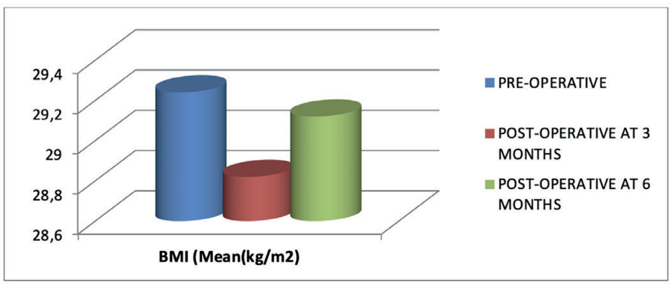

Figure 1. Change graph of BMI scores
BMI: Body mass index

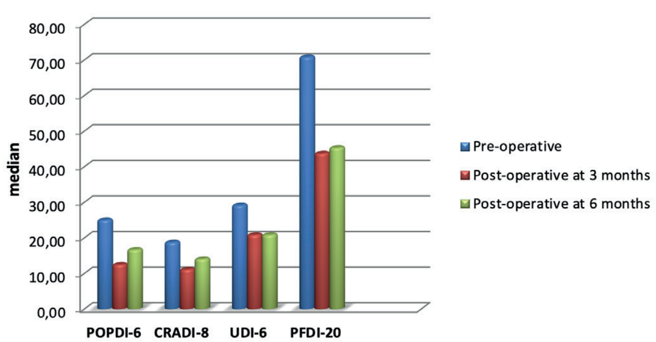

Figure 2. Change graph of POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores (median values)
POPDI-6: Pelvic organ prolapse distress inventory-6, CRADI-8: Colorectal-anal distress inventory-8, UDI-6: Urinary distress inventory-6, PFDI-20: Pelvic floor distress inventory-20

was 25 (0-45.8), the preoperative CRADI-8 median was 18.7 (0-53.1), the preoperative UDI-6 median was 29.1 (0-75), and the preoperative PFDI-20 median was 70.8 (0-173.9) (Figure 2). At the 3rd month postoperative, the patients' POPDI-6 median was 12.5 (0-54.1), the CRADI-8 median was 11.1 (0-48.8), the UDI-6 median was 20.8 (0-62.5), and the PFDI-20 median was 43.7 (8.3-119.7) (Figure 2). At the 6th month postoperative, the patients' POPDI-6 median was 16.6 (0-54.1), the CRADI-8 median was 14 (0-50), the UDI-6 median was 20.8 (0-62.5), and the PFDI-20 median was 45.3 (2.9-133.3) (Figure 2). The patients' POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores are presented in Table 2.

The comparison of preoperative POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores with the postoperative 3rd month scores is presented in Table 3. The patients' preoperative POPDI-6 median was 25 (0-45.8), while the postoperative 3rd month median was 12.5 (0-54.1), and the difference was statistically significant (p<0.001). The preoperative CRADI-8 median was 18.7 (0-53.1), and the postoperative 3rd month median was 11.1 (0-48.8), with a statistically significant difference (p<0.001). The preoperative UDI-6 median was 29.1 (0-75), and the postoperative 3rd month median was 20.8 (0-62.5), showing a statistically significant difference (p<0.001). The preoperative PFDI-20 median was 70.8 (0-173.9), while the postoperative 3rd month median was 43.7 (0-119.7), and the difference was statistically significant (p<0.001).

The comparison of preoperative POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores with the postoperative 6th month scores is presented in Table 4. The patients' preoperative POPDI-6 median was 25 (0-45.8), while the postoperative 6th month median was 16.6 (0-54.1), and the difference was statistically significant (p<0.001). The preoperative CRADI-8 median was 18.7 (0-53.1), and the postoperative 6th month median was 14 (0-50), with a statistically significant difference (p=0.001). The preoperative UDI-6 median was 29.1 (0-75), and the postoperative 6th month median was 20.8 (0-62.5), showing a statistically significant difference (p<0.001). The preoperative PFDI-20 median was 70.8 (0-173.9), while the postoperative 6th month median was 45.3 (2.9-133.3), and the difference was statistically significant (p<0.001).

The comparison of postoperative 3rd month POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores with the postoperative 6th month scores is presented in Table 5. The patients' postoperative 3rd month POPDI-6 median was 12.5 (0-54.1), while the postoperative 6th month median was 16.6 (0-54.1), and the difference was not statistically significant (p=0.109). The postoperative 3rd month

Table 2. POPDI-6, CRADI-8, UDI-6, PFDI-20 scores

Survey	Mean (±SD)	Median	Minimum	Maximum
Pre-operative POPDI-6	24.3 (±13.9)	25	0	45.8
Pre-operative CRADI-8	19 (±13.3)	18.7	0	53.1
Pre-operative UDI-6	33.4 (±21)	29.1	0	75
Pre-operative PFDI-20	77.2 (±39.3)	70.8	0	173.9
Post-operative 3-month POPDI-6	15 (±12)	12.5	0	54.1
Post-operative 3-month CRADI-8	14.1 (±11.1)	11.1	0	48.8
Post-operative 3-month UDI-6	23.4 (±16.8)	20.8	0	62.5
Post-operative 3-month PFDI-20	52.4 (±33.1)	43.7	8.3	119.7
Post-operative 6-month POPDI-6	15.9 (±12.4)	16.6	0	54.1
Post-operative 6-month CRADI-8	15.1 (±11.5)	14	0	50
Post-operative 6-month UDI-6	24.5 (±17.3)	20.8	0	62.5
Post-operative 6-month PFDI-20	54.9 (±36.1)	45.3	2.9	133.3

The Kolmogorov-Smirnov test was used for normality testing. It was observed that the data did not conform to a normal distribution. The UDI-6 scores showed normal distribution. POPDI-6: Pelvic organ prolapse distress inventory-6, CRADI-8: Colorectal-anal distress inventory-8, UDI-6: Urinary distress inventory-6, PFDI-20: Pelvic floor distress inventory-20

CRADI-8 median was 11.1 (0-48.8), and the postoperative 6th month median was 14 (0-50), with no statistically significant difference (p=0.058). The postoperative 3rd month UDI-6 median was 20.8 (0-62.5) with a mean ± standard deviation of 23.4±16.8, while the postoperative 6th month median was 20.8 (0-62.5) with a mean ± standard deviation of 24.5±17.3, and the difference was not statistically significant (p=0.054). The postoperative 3rd month PFDI-20 median was 43.7 (8.3-119.7), and the postoperative 6th month median was 45.3 (2.9-133.3), with no statistically significant difference (p=0.095).

The results indicate a positive and statistically significant relationship between BMI and the preoperative PFDI-20 score (r=0.323, p=0.011). This finding suggests that patients with a higher BMI experience more severe symptoms related to PFD than patients with lower BMI. This result shows that BMI has a significant impact on pelvic floor health and obese patients may have weaker pelvic floor function.

The correlation analysis conducted three months after surgery shows that the relationship between BMI and PFDI-20 score has become slightly stronger compared to the preoperative period (r=0.356, p=0.006). This finding suggests that patients with higher BMI may show less improvement in pelvic floor symptoms after surgery. Although surgery generally reduces symptoms, overweight patients may experience a lower rate of recovery. This indicates that obesity may influence the treatment response process and that additional strategies may be required for pelvic floor rehabilitation in obese patients.

Sixth months after surgery, the positive correlation between BMI and PFDI-20 score persists, although the correlation coefficient has slightly decreased compared to the third month (r=0.344, p=0.007). This result suggests that surgery continues to improve symptoms in the long-term, but patients with higher BMI still experience more significant symptoms. This finding points at the importance of weight management as a supportive factor in pelvic floor health.

Table 3. Comparison of preoperative and postoperative 3-month POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores

	Pre-operative[1]	Post-operative at 3 months[1]	p-value*
POPDI-6	25 (0-45.8)	12.5 (0-54.1)	**<0.001**
CRADI-8	18.7 (0-53.1)	11.1 (0-48.8)	**<0.001**
UDI-6	29.1 (0-75)	20.8 (0-62.5)	**<0.001**
PFDI-20	70.8 (0-173.9)	43.7 (8.3-119.7)	**<0.001**

[1]: Median (minimum-maximum), *: Wilcoxon signed-ranks test, POPDI-6: Pelvic organ prolapse distress inventory-6, CRADI-8: Colorectal-anal distress inventory-8, UDI-6: Urinary distress inventory-6, PFDI-20: Pelvic floor distress inventory-20

Table 4. Comparison of pre-operative and post-operative 6-month POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores

	Pre-operative[1]	Post-operative at 6 months[1]	p-value*
POPDI-6	25 (0-45.8)	16.6 (0-54.1)	**<0.001**
CRADI-8	18.7 (0-53.1)	14 (0-50)	**0.001**
UDI-6	29.1 (0-75)	20.8 (0-62.5)	**<0.001**
PFDI-20	70.8 (0-173.9)	45.3 (2.9-133.3)	**<0.001**

[1]: Median (minimum-maximum), *: Wilcoxon signed-ranks test, POPDI-6: Pelvic organ prolapse distress inventory-6, CRADI-8: Colorectal-anal distress inventory-8, UDI-6: Urinary distress inventory-6, PFDI-20: Pelvic floor distress inventory-20

Table 5. Comparison of post-operative 3-month and post-operative 6-month POPDI-6, CRADI-8, UDI-6, and PFDI-20 scores

	Postoperative 3 months[1]	Postoperative at 6 months[1]	*p*-value
POPDI-6	12.5 (0-54.1)	16.6 (0-54.1)	0.109*
CRADI-8	11.1 (0 48.8)	14 (0-50)	0.058*
UDI-6	20.8 (0-62.5)	20.8 (0-62.5)	0.054**
PFDI-20	43.7 (8.3-119.7)	45.3 (2.9-133.3)	0.095*

[1]: Median (minimum-maksimum),*: Wilcoxon signed-ranks test, **: Paired samples test, POPDI-6: Pelvic organ prolapse distress inventory-6, CRADI-8: Colorectal-anal distress inventory-8, UDI-6: Urinary distress inventory-6, PFDI-20: Pelvic floor distress inventory-20

DISCUSSION

In our prospective cohort study, we investigated the effects of total abdominal intrafascial hysterectomy on pelvic floor functions to determine whether the intrafascial technique provides a protective effect on these functions. As observed, many studies in the literature suggest that extrafascial hysterectomies, particularly radical hysterectomies, impair pelvic floor functions. Some studies indicate no connection between pelvic floor functions and hysterectomy, while others suggest possible recovery of pelvic floor functions posthysterectomy. In our study, total abdominal hysterectomy performed using the intrafascial technique resulted in a significant reduction in PFDI-20 scores compared to preoperative scores.

Rortveit et al.[13] demonstrated that hysterectomy is associated with POP. However, our study concluded that hysterectomy performed using the intrafascial technique does not pose a risk for POP.

Tan et al.[14] conducted a study investigating the effects of total abdominal, total laparoscopic, total vaginal, total abdominal intrafascial, and total laparoscopic intrafascial hysterectomy on pelvic floor functions. In this study, which included a total of 260 patients, pelvic examinations, pelvic organ prolapse quantification (POP-Q), and pelvic muscle strength tests were performed at preoperative, postoperative 6 months, and postoperative 12 months. The PFDI-20 and female sexual function index questionnaires were administered. At postoperative 6 and 12 months, the incidence of POP and POP-Q scores in the total abdominal and total laparoscopic hysterectomy groups using the intrafascial technique were found to be significantly different from those in other groups, suggesting that the intrafascial technique is protective against POP. However, no significant difference was found between the intrafascial technique and other groups concerning stress urinary incontinence and colorectal anal dysfunction. In our study, we also demonstrated that total abdominal hysterectomy performed using the intrafascial technique is protective regarding pelvic floor functions.

In a retrospective study by Vermeulen et al.[15], 247 women who underwent laparoscopic and vaginal hysterectomy were evaluated using POP-Q examination and PFDI-20 questionnaire an average of 16 years later. It was found that 62% of the patients had a stage ≥2 prolapse according to the POP-Q, and 52% of these patients experienced moderate and/or severe symptoms according to the PFDI-20. Although our study indicates that performing hysterectomy using the intrafascial technique is protective of pelvic floor functions, the 6th month follow-up period may be insufficient to predict long-term outcomes.

Based on the hypothesis that hysterectomies performed using the intrafascial technique preserve fascia, ligaments, muscles, and nerves, thereby not impairing pelvic floor functions, our study found that the significant reduction in PFDI-20 scores at postoperative 3rd and 6th months compared to the preoperative period indicates that the intrafascial hysterectomy technique is protective of pelvic floor functions. We attribute this to 86% of patients having fibroids and their relief from symptoms caused by these fibroids (such as frequent urination, groin pain, a feeling of heaviness, and constipation) post-surgery. In a prospective study conducted by Dancz et al.[16] with 145 volunteers, patients who underwent surgical treatment (hysterectomy, myomectomy) due to uterine fibroids were evaluated using the PFDI-20 questionnaire before and after surgery, and it was concluded that the surgical intervention improved pelvic floor symptoms. Additionally, the significant reduction in patients' BMI postoperatively, along with the significant positive correlation between BMI and PFDI-20 scores at preoperative, postoperative 3rd months, and postoperative 6th months, is also noteworthy in explaining the decrease in scores. In a study by Özgül et al.[17], a significant correlation was found between BMI and PFDI-20 scores. Moreover, in a study by Leshem et al.[18], significant improvement in pelvic floor symptoms was observed postoperatively in patients who underwent bariatric surgery due to obesity.

In our study, we concluded that total abdominal hysterectomy performed using the intrafascial technique is protective regarding pelvic floor functions. It would also be beneficial to investigate long-term outcomes.

Study Limitations

Our article is not a prospective randomized controlled trial comparing total abdominal extrafascial hysterectomy.

Additionally, the 6th month postoperative follow-up period may be insufficient for predicting outcomes in the later stages.

CONCLUSION

When planning a hysterectomy for benign indications, it is important to prefer the intrafascial hysterectomy technique, as it is expected to preserve pelvic floor functions. Furthermore, conducting prospective randomized controlled long-term studies that evaluate and compare hysterectomy techniques and types in this field would be beneficial.

ETHICS

Ethics Committee Approval: All processes related to this thesis study were approved by the Clinical Research Ethics Committee of Muğla Sıtkı Koçman University Rectorate on May 11, 2022, with decision number 9/XI. All procedures conducted in the study adhered to the ethical standards of the Institutional and/or National Research Committee and complied with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent: Those who volunteered to participate were included in the study after obtaining written informed consent.

FOOTNOTES

Contributions

Surgical and Medical Practices: M.O.A., B.K., Concept: M.O.A., Design: M.O.A., Data Collection or Processing: M.O.A., Analysis or Interpretation: M.O.A., B.K., Literature Search: M.O.A., B.K., Writing: M.O.A., B.K.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

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