Original Article

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Follow-up of Fertility, Contraception, and Pregnancy Outcomes After Pelvic Organ Prolapse Surgery

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Abstract

Aim: Pelvic organ prolapse (POP) is a common condition among parous and aging women. While surgical repair is effective, little is known about fertility, contraception, and pregnancy outcomes postoperatively. This study evaluates these aspects to inform preoperative counseling and reproductive planning.

Methods: This retrospective observational study included 122 sexually active women aged 18-45 years with negative preoperative pregnancy tests who underwent POP surgery between January 2019 and September 2023. Data were collected from hospital records and follow-up calls and analyzed using SPSS.

Results: The mean patient age was 39.9±4.4 years. The most frequent prolapse types were rectocele (68.9%) and cystocele (54.1%). Preoperatively, 54.1% of patients used no contraception, while 21.3% used intrauterine devices and 9.8% underwent bilateral tubal ligation (BTL) or bilateral salpingectomy (BS). Postoperatively, the percentage of individuals not using contraception dropped to 40.2%, and BTL/BS use rose to 20.5%. Two patients conceived postoperatively, both with favorable short-term outcomes. Postoperative complications were rare, with pelvic pain (8.2%) as the most common.

Conclusion: Findings highlight a shift toward permanent contraception post-surgery, influenced by completed fertility and cancer prevention. Pelvic organ prolapse surgery, particularly uterine-sparing approaches, can preserve fertility in selected cases. However, early menopause or ovarian failure remains a risk. Pelvic organ prolapse surgery in reproductive-aged women requires individualized counseling on fertility and contraception. Surgical planning should include discussion of reproductive goals, and long-term follow-up is essential to monitor outcomes and support informed choices.

Keywords: Pelvic organ prolapse, urogynecologic surgery, contraception, fertility

Introduction

Pelvic organ prolapse (POP) is a prevalent condition among parous and aging women, with a lifetime risk of undergoing a surgical intervention for prolapse or urinary incontinence (UI) estimated at 11.1% by the age of 80 (1). Since the 1900's, anterior colporrhaphy (CA) and posterior colporrhaphy (CP) have been widely used in POP surgery (2). Over the past 30 years, procedures such as tension-free vaginal tape (TVT) (3), transobturator tape (TOT) (4), and, more recently, suspension and ligament surgeries have gained popularity (5). Pelvic organ prolapse surgery utilizes various techniques, with organ-preserving approaches becoming increasingly popular (6-8). Patients planning pregnancy can be reassured about their ability to conceive and deliver vaginally (9). Boyd et al. (10) confirmed the safety and durability of

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POP surgery during and after pregnancy, aligning with previous case series.

Due to the risk of UI recurrence during and after pregnancy, it is advisable to delay suburethral sling surgery until family planning is complete (11). The literature on pregnancy after surgical treatment of UI is limited, with no clear recommendations for management (11-14). The 2006 French national survey found no clear guidance on the optimal delay between suburethral sling placement and pregnancy (15). However, patients should be informed about potential pregnancy and the risk of UI recurrence postpartum (11).

Various studies have examined the outcomes of planned and unplanned pregnancies following these surgeries, the necessity of pre- and postoperative contraceptive counseling, contraceptive method preferences and failure rates, and the impact of fertility desire. Research in this area is ongoing and will likely continue.

We hypothesized that in reproductive-aged women undergoing POP surgery-particularly in those scheduled for incontinence procedures-appropriate contraceptive counseling would optimize surgical timing and support decision-making regarding the mode of delivery in potential postoperative pregnancies.

This study aims to provide patients with a comprehensive understanding of the diagnostic and treatment spectrum before POP surgery. Additionally, it seeks to enhance awareness of contraception options and improve patients' knowledge and health literacy regarding unintended pregnancies following prolapse surgery.

Materials and Methods

Compliance with Ethical Standards

Approval was obtained from the University of Health Sciences Türkiye, Istanbul Training and Research Hospital Clinical Research Ethics Committee (approval no.: 276, date: 13.10.2023). All authors fully complied with the Declaration of Helsinki during the course of the study. Due to its status as a research hospital, informed consent is obtained from all patients admitted.

Study Design

This study was planned as a retrospective case-control study. The flowchart of the study is summarized in Figure 1.

Sample and Setting

This study is a retrospective case-control study conducted between January 2019 and September 2023 at the University of Health Sciences Türkiye, Istanbul Training and Research Hospital in Istanbul, Türkiye. A total of 122 patients who met the inclusion criteria were included in the study. The inclusion criteria were sexually active women aged 18 to 45 years with a negative pregnancy test during the preoperative evaluation.

Data Collection Tools

The study data were collected using the "Personal Information Form". This was prepared by the researcher by scanning the relevant literature (1-6,8,9) and consists of questions about the socio-demographic characteristics of the patients participating in the study and obstetric and operation-related features.

Data Collection

Patient data covering the specified period were retrospectively reviewed using the hospital's electronic database and archived files. A total of 289 patient records were evaluated. After excluding those who did not meet the inclusion criteria, those who did not attend routine postoperative follow-up visits, those who could not be reached by phone for follow-up and research purposes, and those with incomplete or insufficient data, the study was continued with 122 patients who met all the criteria.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Sciences (IBM SPSS Statistics, version 27). Demographics and clinical characteristics of the participants were expressed as frequency (percentage) or as mean ± standard deviation. Number, percentage calculation, and average (minimum and maximum) criteria were used to evaluate the data. To evaluate differences between preoperative and postoperative contraceptive preferences, McNemar's test was applied to paired categorical data (Supplementary Table 1). Contraceptive methods of very low frequency and distinct clinical implications-such as hysterectomy, depot medroxyprogesterone acetate, early menopause, and premature ovarian insufficiency (POI) were excluded from the comparative analysis to ensure statistical validity and interpretative clarity. These methods were observed in 3 patients preoperatively and 9 patients postoperatively but were not included in the McNemar test.

Results

The study included 122 women with a mean age of 39.9±4.4 years (Table 1). Table 2 summarizes patients' medical history and risk factors, highlighting that most women had prior abdominopelvic surgery (particularly cesarean section) and notable rates of smoking and chronic comorbidities such as hypertension and diabetes. Postoperative complications were infrequent, with pelvic pain being the most common (8.2%) (Table 3).

Regarding contraceptive use, the proportion of patients reporting no contraception significantly decreased after surgery (from 54.1% to 40.2%), while the use of permanent methods BTL/BS significantly

increased (from 9.8% to 20.5%) (Bonferroni-corrected p<0.01) (Table 3). No significant changes were observed for reversible methods. Among the subgroup of women who underwent postoperative BTL/BS, all had shifted to a permanent contraceptive method (p=0.031).

Two women conceived after POP surgery, and both had favorable short-term outcomes. Additionally, the incidence of hysterectomy increased from 1.6% preoperatively to 4.9% postoperatively, and a small number of patients experienced endocrine conditions negatively affecting fertility (early menopause 1.6%, POI 0.8%).

Overall, the results demonstrate a significant shift toward permanent contraception after POP surgery, with fertility preserved in selected cases.

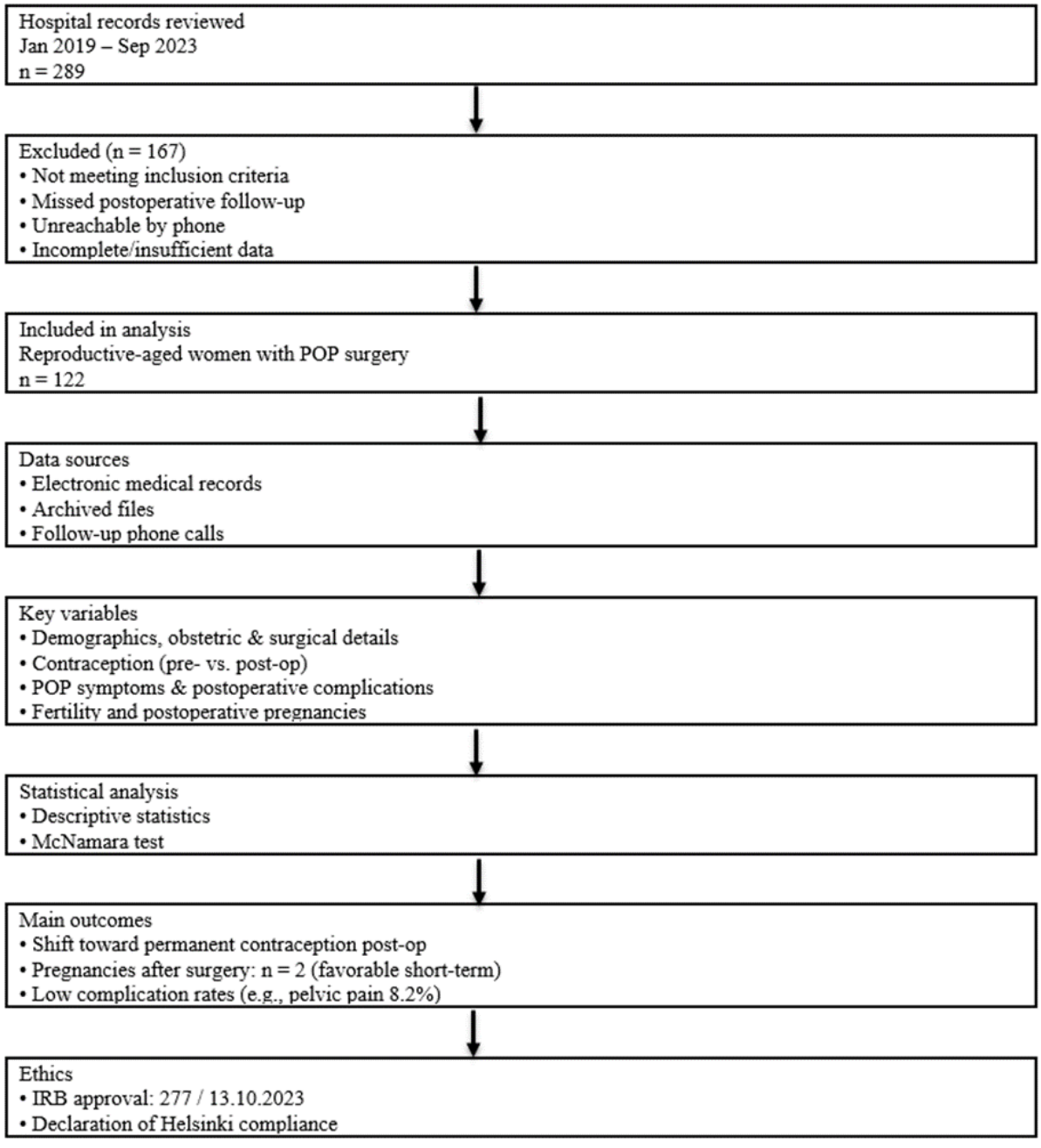


Figure 1. Flowchart of the study
POP: Pelvic organ prolapse

Discussion

Pelvic floor dysfunction is common among older women and often requires surgical treatment, with a significant risk of reoperation (1). In our cohort, the mean age was 39.9 years, and the majority of patients had a history of vaginal delivery, which is consistent with known risk factors such as parity and age (16). The high preoperative prevalence of rectocele (68.9%) and cystocele (54.1%) observed in our population underscores the dominance of anterior and posterior compartment defects, whereas apical prolapse remained relatively rare (10.7%) (Table 2). This distribution aligns with the literature, where anterior and posterior prolapse are more frequently reported as primary indications for surgical intervention (17).

Our study provides specific insights into reproductive health outcomes in women of childbearing age undergoing POP surgery, an area where the literature remains scarce. The most striking finding was the significant increase in contraception use postoperatively, with a concomitant rise in permanent methods such as BTL/BS (18,19). This change suggests that POP surgery often coincides with the end of fertility and reflects clinicians' increasing emphasis on opportunistic salpingectomy as a cancer-preventive strategy (7,20).

Fertility preservation is another key observation. In our cohort, two patients conceived postoperatively, both resulting in favorable outcomes. Although the numbers are small, these pregnancies demonstrate that uterine-sparing POP procedures do not preclude future fertility. This is consistent with prior reports indicating that pregnancy, while uncommon, can occur following uterine-preserving prolapse surgery (7,8,21,22). These results highlight the importance of comprehensive preoperative counseling, stressing that women who do not desire pregnancy must still use effective contraception after surgery. Notably, a small percentage of patients experienced early menopause (1.6%) and premature ovarian failure (0.8%), which are critical factors when evaluating postoperative fertility potential.

Urinary incontinence was present in a substantial proportion of our cohort, with 32% reporting stress UI and 17.2% mixed UI preoperatively (Graphic 1). In cases

Table 1. Mean and standard deviation values of sociodemographic continuous variables (n=122)

Variables	Mean ± SD	Min.	Max.
Age (years)	39.92±4.43	27	45
Number of vaginal deliveries	2.98±1.68	0	9
Body mass index	28.05±4.69	18	43
Time since surgery (months)	18.93±14.90	1	52
Patient satisfaction score (0-5)	3.48±0.97	0	5

Min.: Minimum, Max.: Maximum, SD: Standard deviation

Table 2. Patients' medical history and risk factors (n=122)

Variables	n	%
Educational status		
Illiterate	7	5.7
Primary school	69	56.6
Middle school	17	13.9
High school	21	17.2
University	8	6.6
Infertilite history		
Yes	6	4.9
No	116	95.1
Smoking history		
Yes	37	30.3
No	85	69.7
History of abdominopelvic surgery		
None	82	67.2
TOT	1	0.8
C/S	31	25.4
Sacrohysteropexy	2	1.6
Hysterectomy	4	3.3
CA	1	0,8
History of heavy physical activity		
Yes	9	7.4
No	113	92.6
History of difficult delivery		
Yes	5	4.1
No	117	95.9
History of asthma/COPD		
Yes	12	9.8
No	110	90.2
History of diabetes mellitus		
Yes	7	5.7
No	115	94.3
History of hypertension		
Yes	9	7.4
No	113	92.6
History of cardiac disease		
Yes	6	4.9
No	116	95.1
Other risk factors		
Yes	3	2.5
No	119	97.5
Total	122	100

C/S: Cesarean section, TOT: Transobturator tape, CA: Anterior colporrhaphy, COPD: Chronic obstructive pulmonary disease

Table 3. Surgical procedures, contraceptive use, and postoperative complications (n=122)					
Surgical procedures	**n**	**%**	**Preoperative contraceptive methods**	**n**	**%**
TOT	27	22.1	None	66	54.1
TOT+CAP	7	5.7	Withdrawal	9	7.4
CP	25	20.5	IUD	26	21.3
CA	6	4.9	Condom	3	2.5
TVT	6	4.9	BTL/BS	12	9.8
TVT+CAP	1	0.8	Oral contraceptive pills	3	2.5
CAP	39	32.0	DMPA	1	0.8
TOT+CP	4	3.3	Hysterectomized	2	1.6
TOT+CA	1	0.8			
CP+Burch colposuspension	2	1.6			
Sacropexy	3	2.5			
McCall culdoplasty+CA	1	0.8			
Postoperative complications	**n**	**%**	**Postoperative contraceptive methods**	**n**	**%**
None	100	82.0	None	49	40.2
Pain	10	8.2	Withdrawal	6	4.9
Dyspareunia	2	1.6	IUD	25	20.5
Surgical site complication	4	3.3	Condom	4	3.3
Recurrent UTI	2	1.6	BTL/BS	25	20.5
Mesh erosion	2	1.6	Oral contraceptive pills	4	3.3
Recurrence of symptoms	1	0.8	Hysterectomized	6	4.9
Cuff prolapse	1	0.8	Early menopause	2	1.6
			Premature ovarian insufficiency	1	0.8
Total	122	100	Total	122	100

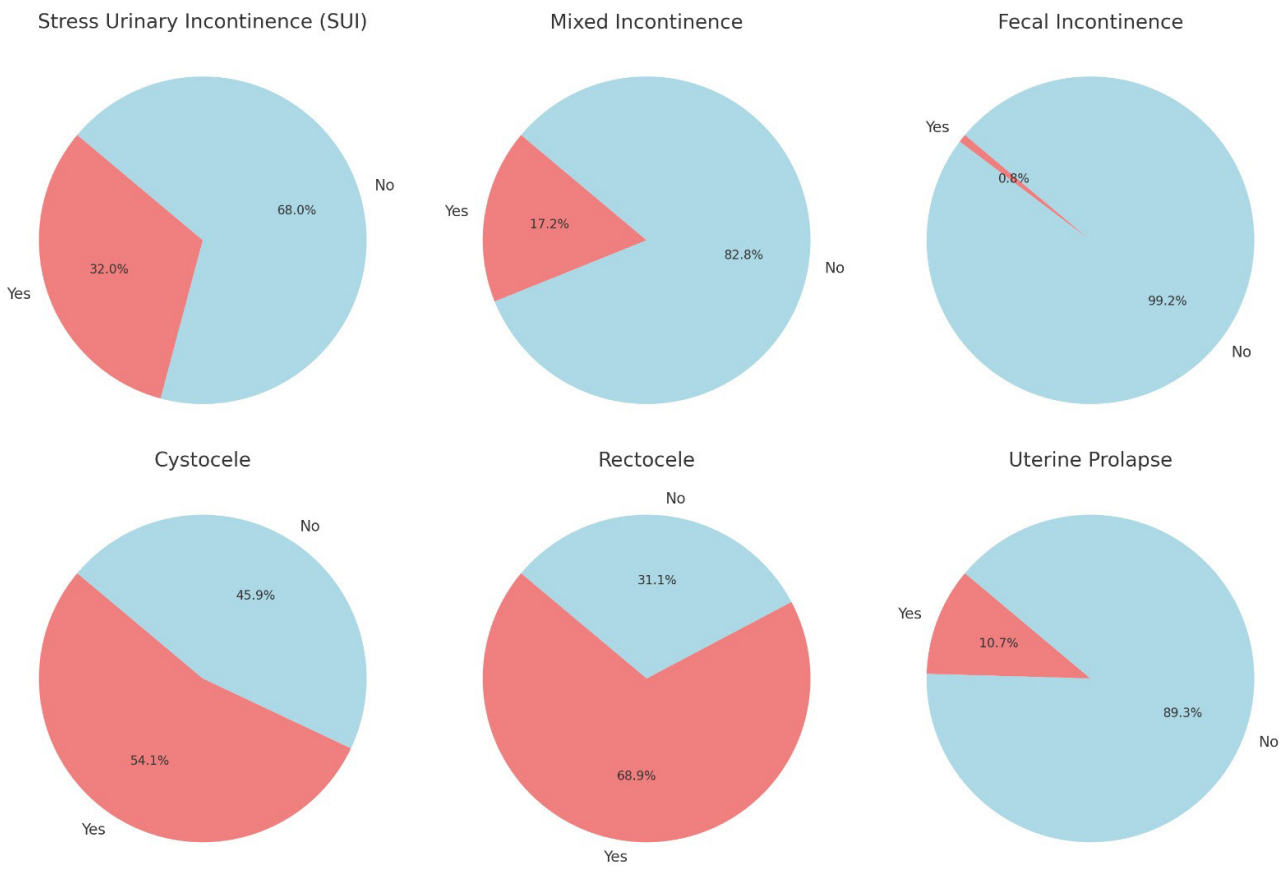
TOT: Transobturator tape, CAP: Anterior and posterior colporrhaphy, CP: Posterior colporrhaphy, CA: Anterior colporrhaphy, TVT: Tension-free vaginal tape, IUD: Intrauterine device, BTL: Bilateral tubal ligation, BS: Bilateral salpingectomy, DMPA: Depot medroxyprogesterone acetate, UTI: Urinary tract infection

where conservative management (rehabilitation) fails and delaying surgery is not feasible, suburethral sling placement may be considered (11). In our cohort, 38.5% of patients underwent surgery for stress UI; among these, 83.0% received TOT and 14.9% TVT, highlighting a clear preference for TOT in routine practice. Notably, one 36-year-old multigravida (G6) patient conceived during the 18-month postoperative follow-up period and subsequently delivered by cesarean section, a mode of delivery often favored due to patient or physician concerns, as similarly reported in the literature (10,15).

Evidence on pregnancy outcomes after POP or UI surgery remains mixed, and the lack of randomized studies due to ethical constraints complicates clinical decision-making (12,15,23). With regard to CP, Esercan and Demir (9) reported effective correction of symptomatic rectocele, reassuring patients planning pregnancy about their ability to conceive and deliver vaginally. In our study, classic CP alone was performed in 25 patients (20.5%), while a total of 79 patients (64.8%), including those who had classic CP alone, underwent CP as part of their surgical management. In the subgroup of patients who chose postoperative BTL/BS, (Supplementary Table 2), 12 had CP, 9 underwent combined CAP, and 1 underwent CA. The high rate of definitive contraception in this subgroup suggests that patients undergoing reconstructive pelvic surgery received effective contraceptive counseling, reflecting a proactive approach to long-term reproductive planning in the context of pelvic floor reconstruction (24).

Regarding McCall culdoplasty, one study discouraged its use in patients with a history of vaginal delivery of macrosomic infants because of significantly higher surgical failure rates (25). In line with this, only one patient in our cohort underwent McCall culdoplasty, reflecting a cautious and selective application of this technique.

Complication rates in our study were low. Pelvic pain was the most frequently reported issue (8.2%), while mesh erosion, recurrence, or cuff prolapse were rare.



Graphic 1. Distribution of symptoms and clinical findings

These findings support the safety and durability of POP surgery in younger women, as previously published series indicate (22,24).

Our data emphasize the need to standardize preoperative reproductive counseling, aligning surgical planning with women's long-term fertility goals.

Study Limitations

This research carries inherent constraints that merit consideration. The retrospective methodology, while practical, depends heavily on the precision and completeness of archived patient records and subjective follow-up responses, which may introduce potential biases. Being a single-center study conducted in a tertiary care institution, the findings may not be broadly applicable across diverse healthcare settings or populations. The rarity of postoperative pregnancies in this cohort limits the capacity to draw definitive conclusions about fertility preservation and gestational outcomes following prolapse repair. Some patients were unreachable or had insufficient data, which may have limited the robustness of the dataset. Moreover, variations in the delivery and documentation of contraceptive and fertility counseling were not assessed, despite their likely impact on patient choices. The follow-up period, though adequate for short-term assessment, may be insufficient to fully capture long-term outcomes such as delayed prolapse recurrence or evolving reproductive health concerns.

Nevertheless, this study offers a valuable perspective by specifically addressing a relatively understudied group-women of reproductive age undergoing POP surgery. It presents a detailed examination of contraceptive use patterns, surgical decisions, and reproductive outcomes in a real-world clinical context. The inclusion of a sizable patient group and the focus on both pre- and postoperative reproductive behavior make it a meaningful contribution to current urogynecological knowledge. Its findings emphasize the need for proactive, personalized counseling and may guide clinicians in shaping informed, patient-centered care strategies for women balancing pelvic floor health with fertility considerations.

Despite these limitations, this study is one of the few to specifically address reproductive-aged women undergoing POP surgery. The relatively large cohort, the focus on both pre- and postoperative contraceptive

behavior, and the integration of real-world clinical data provide valuable insights. The results emphasize the importance of individualized counseling and contribute to the development of evidence-based reproductive planning strategies in women with POP.

Conclusion

Pelvic organ prolapse surgery in reproductive-aged women requires a delicate balance between anatomical correction and reproductive planning. Our findings indicate a postoperative shift toward permanent contraceptive methods and highlight that fertility can be preserved in selected cases. Nevertheless, this study has certain limitations: its retrospective design, reliance on a single-center sample, and the limited number of postoperative pregnancies restrict the generalizability and depth of the conclusions. Despite these constraints, the study underscores the importance of individualized, preoperative fertility and contraceptive counseling, as well as long-term follow-up. Future prospective, multicenter studies are warranted to establish standardized guidelines for reproductive counseling and postoperative care in this patient population.

Ethics

Ethics Committee Approval: Approval was obtained from the University of Health Sciences Türkiye, Istanbul Training and Research Hospital Clinical Research Ethics Committee (approval no.: 276, date: 13.10.2023). All authors fully complied with the Declaration of Helsinki during the course of the study.

Informed Consent: Due to its status as a research hospital, informed consent is obtained from all patients admitted.

Footnotes

Authorship Contributions

Surgicial and Medical Practices: T.I., N.U., A.F., Concept: T.I., N.U., A.F., Design: T.I., O.K., N.U., A.F., Data Collection or Processing: T.I., O.K., N.U., A.F., Analysis or Interpretation: T.I., O.K., Literature Search: T.I., Writing: T.I., O.K.

Conflict of Interest: No conflicts of interest were declared by the authors.

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Supplementary Tables 1, 2: https://d2v96fxpocvxx.cloudfront.net/6548c443-00ef-4a8c-a306-c0848f02b51f/content-images/7d393c5c-616a-466f-af63-06b194090873.pdf