ORIGINAL ARTICLE
UDC: 618.1-089
DOI: https://doi.org/10.2298/VSP231206048I

Clinical outcomes of LeFort colpocleisis: a single-center experience from Turkey

Klinički ishodi Lefortove kolpokleize: iskustvo centra iz Turske

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Abstract

Background/Aim. LeFort colpocleisis (LFC) is a procedure for treating pelvic organ prolapse (POP) in women. The aim of the study was to assess the sociodemographic characteristics, anatomical outcomes, satisfaction, and clinical outcomes of patients who underwent LFC for POP. **Methods.** The study retrospectively and consecutively included 103 patients who underwent LFC for stage III and stage IV POP between January 2010 and December 2022. The participants' sociodemographic characteristics and clinical outcomes were documented. The Turkish version of the Pelvic Floor Distress Inventory (PFDI-20) questionnaire was used to determine quality of life. **Results.** The patients' mean age was 73.1 ± 26.7 years, mean body mass index 27.4 ± 3.8 kg/m^2, parity 4.8 ± 1.5, smoking rate 12.6%, POP quantification (POP-Q) stage III 30.1%, and POP-Q stage IV 69.9%. Their satisfaction rate results were 93.3%. Significant differences were observed in the preoperative period compared to the postoperative period in constipation (40.7% vs. 26.2%; p = 0.038), difficult defecation (22.3% vs. 8.7; p = 0.012), fecal incontinence (18.4% vs. 7.7%; p = 0.039), stress urinary incontinence (25.2% vs. 4.8%; p < 0.001), urge incontinence (49.5% vs. 27.1%, p = 0.001), voiding dysfunction (37.8% vs. 23.3%; p = 0.002), and urinary retention (42.7% vs. 12.6%; p < 0.001). Postoperative PFDI-20 scores were also significantly lower compared to the preoperative period (57.19 ± 16.57 vs. 21.62 ± 6.96; p < 0.001). **Conclusion.** This study showed that LFC has been established as a surgical procedure with high anatomical success, high patient satisfaction rates, and minimal complications, especially in advanced POP with age-related comorbidities.

Key words:
gynecologic surgical procedures; pelvic organ prolapse; quality of life; surveys and questionnaires; women.

Apstrakt

Uvod/Cilj. Lefortova kolpokleiza (LFK) je procedura za lečenje prolapsa karličnih organa (PKO) kod žena. Cilj rada bio je da se procene socio-demografske karakteristike, anatomski ishodi, zadovoljstvo i klinički ishodi kod bolesnica kojima je zbog PKO urađena LFK. **Metode.** U studiju su uključene 103 bolesnice koje su retrospektivno i uzastopno, od januara 2010. do decembra 2022. godine, bile podvrgnute LFK sa PKO III i IV stadijuma. Analizirani su socio-demografske karakteristike i klinički ishodi učesnica studije. Za određivanje kvaliteta života korišćena je turska verzija upitnika *Pelvic Floor Distress Inventory* (PFDI-20). **Rezultati.** Prosečna starost bolesnica bila je 73,1 ± 26,7 godina, srednja vrednost indeksa telesne mase 27,4 ± 3,8 kg/m^2, paritet 4,8 ± 1,5, stopa pušenja 12,6%, kvantifikacija PKO (PKO-K) stadijum III 30,1% i PKO-K stadijum IV 69,9%. Stopa zadovoljstva rezultatima intervencije iznosila je 93,3%. Zapažena je značajna razlika u preoperativnom periodu, u poređenju sa postoperativnim periodom, u konstipaciji (40,7% vs. 26,2%; p = 0,038), otežanoj defekaciji (22,3% vs. 8,7%; p = 0,012), fekalnoj inkontinenciji (18,4% vs. 7,7%; p = 0,039), fizičkim naporom-indukovanoj urinarnoj inkontinenciji (25,2% vs. 4,8%; p < 0,001), urgentnoj inkontinenciji (49,5% vs. 27,1%; p = 0,001), disfunkciji mokrenja (37,8% vs. 23,3%; p = 0.002) i retenciji urina (42,7% vs. 12,6%; p < 0,001). Rezultati PFDI-20 u postoperativnom periodu, u poređenju sa rezultatima u preoperativnom periodu, takođe su bili značajno niži (57,19 ± 16,57 vs. 21.62 ± 6.96; p < 0,001). **Zaključak.** Ova studija je pokazala da je LFK hirurška procedura sa visokim anatomskim uspehom i stepenom zadovoljstva bolesnica, minimalnim komplikacijama, posebno kod uznapredovalog PKO sa komorbiditetima povezanim sa životnim dobom.

Ključne reči:
hirurgija, ginekološka, procedure; karlični organi, prolaps; kvalitet života; ankete i upitnici; žene.

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Introduction

Surgical procedures may be required with advancing age in 20% of women with pelvic organ prolapse (POP), a condition seen in approximately 6% of women over 70 years of age [1, 2]. Moreover, due to the increasing age of the world population, these rates will inevitably rise further. POP may reduce women's quality of life and cause various adverse outcomes, such as recurrent urinary tract infections (UTIs) [3]. The risk of mortality in patients requiring surgical procedures is approximately 14 times higher due to comorbidities such as hypertension, diabetes mellitus, and chronic pulmonary disease [4].

Although some corrective procedures, such as abdominal or vaginal hysterectomy, anterior or posterior colporrhaphy, sacrocolpopexy, and sacrospinous fixation have been described for POP, these may entail high morbidity and complication rates [5–7]. Additionally, POP frequently recurs following such procedures [8–9]. LeFort colpocleisis (LFC) is a highly effective procedure with low morbidity rates, especially in elderly women who do not wish to engage in vaginal intercourse [1]. Studies have reported a patient satisfaction rate of over 90% in the first two postoperative years [1, 10].

LFC, a vaginal obliterative surgical procedure, was first described by Leon LeFort in 1877 and is a good surgical option, particularly for older women with POP with comorbidities because it can be performed using spinal anesthesia, has a shorter operative time than other operations, and involves less blood loss, faster recovery, and has anatomically good results [11]. However, although LFC is a good surgical option because of its low morbidity and mortality, it should also be remembered that it may lead to functional losses, such as impaired sexual function.

The aim of this study was to assess the sociodemographic characteristics, anatomical results, satisfaction levels, early and late postoperative complications, and functional outcomes of patients who underwent LFC for POP.

Methods

The study covered 103 patients who underwent LFC for stage III and stage IV POP according to POP quantification (POP-Q) [8] between January 2010 and December 2022. The participants were retrospectively and consecutively included in the study. Approval was obtained from the Health Sciences University Antalya Training and Research Hospital Ethics Committee, Turkey (No. 8-4, from 2023). Exclusion criteria were the following: a history of anterior or apical POP surgery, suspicious adnexal masses or other factors capable of indicating pelvic malignancy, incomplete data in the records, and the presence of a mental disorder.

Papanikolau test and pelvic ultrasonography were performed before surgery to exclude potential pathologies. Endometrial biopsy was also performed to exclude endometrial malignancy in case of increased endometrial thickness.

Preoperative preparation

Patients prepared for LFC were admitted to the hospital one day before their scheduled operation and underwent a standard preoperative assessment (cell blood count, coagulation tests, and electrocardiography), together with vaginal ultrasonography, for a final control examination. Prophylactic antibiotics (cefazolin 2 g) were administered intravenously (i.v.) as premedication by a gynecologist in all cases, approximately 30 min before surgery. A bladder catheter was inserted before the surgical procedure and was withdrawn 8–12 hrs after mobilization. Antithrombotic prophylaxis was performed in line with the recommendations of the American College of Obstetricians and Gynecologists and the American College of Chest Physicians. Compression banding was also used.

Surgical procedure for LeFort colpocleisis

All patients underwent spinal anesthesia. A fluid bolus of at least 500 mL of Ringer's lactate solution was given before the procedure. The patient was placed in a flexed sitting or lateral decubitus position, a 27-gauge Sprotte® needle was introduced into the lumbar (L)2-L3, L3-L4, or L4-L5 intervertebral space, and 10–12 mg of 0.5% hyperbaric bupivacaine and 15 µg of fentanyl were then injected. After the procedure, the patient was positioned in a moderate Trendelenburg position to accelerate the spread of the local anesthetic agents in the cephalic direction and to provide a sufficient level of anesthesia.

The prolapsed anterior and posterior vaginal mucosa was drawn in rectangular form using a sterile pen. These rectangular vaginal epithelial areas were separated from the underlying fascia using blunt and sharp dissection. These de-epithelized anterior and posterior surfaces and the borders of the quadrilateral were sutured one by one with overlapping sutures. This suture technique resulted in a natural tunnel being formed on the lateral edges of the vagina, which provided drainage of the external cervical os. The urinary catheter was removed 24 hrs after the operation, and residual bladder urine was measured after voiding. Postoperative voiding dysfunction was defined as residual urine exceeding 50 mL.

The participants' sociodemographic characteristics, comorbidities, early and late postoperative complications, functional outcomes, and Pelvic Floor Distress Inventory (PFDI-20) Questionnaire scores were recorded. Body mass index (BMI) was calculated as body weight in kilograms divided by body height in meters squared. Patients were re-evaluated after three, six, and 12 months and two and three years. Urinary and bowel symptoms were also recorded. Complications occurring within the first postoperative week were classified as early, and those developing between one week and three months as late. The data were retrieved from the hospital database and patient files.

Postoperative patients were asked to choose one of the following options to describe their status: "completely healed", "partially healed", "slightly healed", "unchanged",

and "worsened". The Turkish version of PFDI-20 was completed pre- and post-operatively by all participants. The PFDI-20 includes 20 items and is divided into three inventories, the Pelvic Organ Prolapse Distress Inventory-short form 6 (POPDI-6), the Colon Rectal Anal Distress Inventory-short form 8 (CRADI-8), and the Urinary Distress Inventory-short form 6 (UDI-6). Anatomical and subjective assessments were performed at least 12 months after surgery. Anatomical success was defined as POP-Q sites Ba, C, and Bp above the hymenal ring at least one year after surgery. The presence of a mass beyond the hymen was regarded as an anatomical failure.

Statistical analysis

Data were analyzed on Statistical Package for the Social Sciences (SPSS) version 15.0 for Windows software (SPSS, Chicago, IL, USA). The Kolmogorov-Smirnov test was used to determine the normality of the distribution of all continuous variables. Normally distributed variables were compared between the groups using the paired *t*-test, while the Wilcoxon test was applied in the case of non-normally distributed variables. Categorical data were analyzed using Pearson's Chi-square or Fisher's exact test, as appropriate, and were presented as numbers and percentages. A *p*-value lower than 0.05 was regarded as statistically significant.

Results

A total of 103 participants were included in the final analysis. The participants' sociodemographic characteristics and associated comorbidities are presented in Table 1. Their mean age was 73.1 ± 26.7 years, mean BMI 27.4 ± 3.8, parity 4.8 ± 1.5, smoking rate 12.6%, POP-Q stage III 30.1%, POP-Q stage IV 69. 9%, mean blood loss 78.8 ± 36.5, mean operative time 91.5 ± 23.8, mean hospital stay 2.1 ± 1.2 days, and mean follow-up time 36 (18–84) months. The most common comorbidity was hypertension at 53.3%, followed by diabetes mellitus at 34.9%.

The most common complication in the early and late postoperative period was UTI (Table 2).

The participants' functional and anatomical outcomes are shown in Table 3. Significant decreases occurred after the procedure in the following: constipation (40.7% preoperatively vs. 26.2% postoperatively; $p = 0.038$), difficult defe-

Table 1

Participants' sociodemographic characteristics and associated comorbidities

Parameter	Values
Age (years)	73.1 ± 26.72
BMI (kg/m^2)	27.4 ± 3.8
Parity	4.8 ± 1.54
Smoking rate, n (%)	13 (12.6)
POP-Q stage	
III	31 (30.1)
IV	72 (69.9)
Blood loss (mL)	78.8 ± 36.5
Operative time (minutes)	91.5 ± 23.8
Hospital stay (days)	2.1 ± 1.2
Follow-up (months), mean (min-max)	36 (18–84)
Hypertension	57 (55.3)
Diabetes mellitus	36 (34.9)
Heart disease	32 (31.1)
Chronic pulmonary disease	17 (16.5)
Neurological disorder	13 (12.6)
Cerebrovascular disorder	5 (4.8)
Psychiatric disorder	17 (16.5)

BMI – body mass index; POP-Q – pelvic organ prolapse quantification.
All values are given as median, 25th–75th (percentages) or mean ± standard deviation, except smoking rate and follow-up.

Table 2

Early and late postoperative complications

Parameters	Early	Late
Urinary tract infection	3 (2.9)	8 (7.7)
Urinary retention	#	1 (0.9)
Pelvic hematoma	1 (0.9)	#
Gluteal or perineal pain	1 (0.9)	#
Atrial fibrillation	2 (1.8)	#

All values are given as numbers (percentages).
Note: # means that the specified complication did not exist.

cation (22.3% vs. 8.7%; $p = 0.012$), fecal incontinence (18.4% vs. 7.7%; $p = 0.039$), stress urinary incontinence (25.2% vs. 4.8%; $p < 0.001$), urge incontinence (49.5% vs. 27.1%; $p = 0.001$), voiding dysfunction (37.8% vs. 23.3%; $p = 0.002$), and urinary retention (42.7% vs. 12.6%; $p < 0.001$).

The participants' satisfaction after LFC is summarized in Table 4. Analysis showed that 64.1% of participants regarded their status as very much improved, 24.3% as improved, 4.9% as little improved, and 6.7% as unchanged, while none described it as worse. None of the participants had a recurrence of POP nor did they require re-surgical intervention during the follow-up period.

PFDI-20 scores (57.19 ± 16.57 vs. 21.62 ± 6.96, in the pre- and post-operative periods, respectively; $p < 0.001$), POPDI-6 (28.16 ± 9.41 vs. 10.17 ± 4.15; $p < 0.001$), UDI-6 (22.41 ± 7.21 vs. 7.12 ± 3.24; $p < 0.001$), and CRADI-8 (8.24 ± 5.32 vs. 5.58 ± 3.21; $p = 0.041$) all decreased significantly compared to baseline (Table 5).

Discussion

This study was planned to evaluate the sociodemographic characteristics, anatomical outcomes, patient satisfaction, both early and late postoperative complications, and functional outcomes of patients who underwent LFC for POP in our clinic from January 2010 to December 2022. The results showed that postoperative anatomical and functional outcomes improved compared to the preoperative period and that patient satisfaction also increased.

The incidence of POP increases with age. Studies have shown that this can rise up to 50% at 80 years and above and that comorbid disorders such as hypertension and diabetes mellitus accompany more than half of patients undergoing LFC, especially in that age group [1, 5, 11–14]. Good postoperative pain control and caution in terms of embolism and medical applications are of life-saving importance, particularly for patients with cardiovascular disorders [5, 11]. In

Table 3

Participants' functional and anatomical pre- and post-operative outcomes

Parameter	Preoperative	Postoperative	*p*-value
Constipation	42 (40.7)	27 (26.2)	0.038
Difficult defecation	23 (22.3)	9 (8.7)	0.012
Fecal incontinence	19 (18.4)	8 (7.7)	0.039
Stress urinary incontinence	26 (25.2)	5 (4.8)	< 0.001
Urge incontinence	51 (49.5)	28 (27.1)	0.001
Voiding dysfunction	39 (37.8)	24 (23.3)	0.002
Urinary retention	44 (42.7)	13 (12.6)	< 0.001
Vaginal length	#	2.8 ± 1.4	#
Perineal body	#	4.6 ± 1.2	#
Genital hiatus	#	2.2 ± 0.8	#

All values are given as numbers (percentages) and mean ± standard deviation.
Note: # means that patients had total pelvic prolapse.

Table 4

Participants' satisfaction after LeFort colpocleisis

Parameters	Values
Very much improved	66 (64.1)
Improved	25 (24.3)
Little improved	5 (4.9)
No change	7 (6.7)
Worse	0 (0)

All values are given as numbers (percentages).

Table 5

Pelvic Floor Distress Inventory questionnaire results

Parameters	Preoperative	Postoperative	*p*-values
PFDI-20	57.19 ± 16.57	21.62 ± 6.96	< 0.001
POPDI-6	28.16 ± 9.41	10.17 ± 4.15	< 0.001
UDI-6	22.41 ± 7.21	7.12 ± 3.24	< 0.001
CRADI-8	8.24 ± 5.32	5.58 ± 3.21	0.041

PFDI – Pelvic Floor Distress Inventory; POPDI – Pelvic Organ Prolapse Distress Inventory; UDI – Urinary Distress Inventory; CRADI – Colon Rectal Anal Distress Inventory.
All values are given as mean ± standard deviation.

accordance with the previous literature, more than half of the patients in the present study had comorbid disorders.

LFC seems to be a highly effective surgical procedure with few complications in older women with POP and comorbidities. However, it should be remembered that there is a risk of subsequent recurrence and that this may be exacerbated by advanced age, obesity, genetic predisposition, pelvic floor weakness, and poor surgical technique [5, 12, 15]. Corrective surgical procedures with or without mesh are particularly performed for women with POP who wish to maintain their sex lives. However, it should be remembered that these surgical procedures entail high complication and recurrence rates [1, 12, 15–17].

The reported operative time in LFC in previous studies was between 30 and 135 min, and expected blood loss was between 30 and 450 mL [1, 5, 11]. Operative times and expected blood loss in the present study were compatible with the previous literature at 91.5 ± 23.8 min and 78.8 ± 36.5 mL, respectively. Preoperative and postoperative data in the previous literature are not as extensive or comprehensive as those in the present study. Reported complication rates after LFC are approximately 5% [5, 18, 19]. Our anatomical success rate was close to 100%, and our patient satisfaction rate was 93.3%, findings apparently compatible with the existing literature [11, 20, 21].

Intraoperative and early and late postoperative complications of LFC are very rare [1, 11]. A previous retrospective study evaluated 325 cases of LFC. While UTI was observed most frequently in the early and late postoperative periods, the rate of severe complications in the two postoperative periods was below 3% [11]. The most common both early and late complications in the postoperative period in the present study was UTI. In terms of functional outcomes after LFC, significant improvements have been reported in bowel disorders such as constipation and fecal incontinence, urinary and voiding symptoms such as stress incontinence, urge incontinence, voiding dysfunction, and urinary retention [10, 22]. However, it should also be remembered that sexual functions will be lost after LFC, an obliterative surgical procedure.

The advantages of the present research over other studies evaluating the results of LFC include the fact that all surgical procedures were performed by a single gynecologist and that the interobserver error margin was, therefore, low. A standard surgical procedure was applied in all cases rather than different techniques, postoperative complications were reported separately for the early and late periods, and the cases were followed up for a minimum of three years. The limitations of this study include the fact that it was conducted in a tertiary care institution, that it was a single-center study, and that it involved a retrospective study design.

Conclusion

This study shows that LeFort colpocleisis has proved itself to be a surgical procedure with high anatomical success, high patient satisfaction rates, and minimal complications, one that especially improves bowel and urinary symptoms and quality of life in women with advanced pelvic organ prolapse with age-related comorbidities. Further studies with larger cohorts are now needed to confirm our results.

Conflict of interest

The authors declare no conflict of interest.

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Received on December 6, 2023
Revised on March 21, 2024
Revised on May 6, 2024
Accepted on May 14, 2024
Online First June 2024