

Anatomical and Symptomatic Outcomes in Patients With Le Fort Colpocleisis

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Research Article

Keywords: De Novo Urinary Incontinence, Le Forte Colpocleisis, Lower Urinary Tract Symptoms, Pelvic Organ Prolapse

Posted Date: October 27th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-1005385/v1>

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Abstract

Background: We aimed to evaluate the short term anatomical and symptomatic results of elderly patients on whom Le Fort colpocleisis operation was performed due to pelvic organ prolapse (POP) in our clinic.

Methods: Medical records of fifty-nine sexually inactive and ≥ 65 aged women with stage 2 or higher vaginal or uterine prolapse who underwent Le Fort colpocleisis operation were prospectively analysed. Pre-operative and 12 months post-operative data were recorded. Turkish validated Global Pelvic Floor Bother Questionnaire (GPFBQ) were also evaluated at pre-operative and 12 months post-operative period in all patients. Anatomical success was determined as no prolapse of any POP-Q point at or below 1 cm above the hymen.

Results: A total of 59 patients were conducted in this study. The average age of the patients was 71.67 ± 7.01 (years). The mean BMI was 27.1 ± 9.52 kg/m². POP-Q point C as well as, Gh and TVL measurements were significantly higher after surgery than those at preoperative period ($p < 0.01$, $p < 0.01$, $p < 0.01$, respectively). There was no recurrence in any case. Evaluation of complications at the pre-operative and post-operative 12th month revealed significant differences for SUI, urinary frequency, nocturia, and pelvic pain symptoms during post-operative period ($p: 0.007$, $p < 0.001$, $p: 0.01$, $p < 0.001$; respectively).

Conclusions: Le Fort colpocleisis is a simple and effective procedure that has been found to provide successful anatomical and symptomatic outcomes in sexually inactive and elderly women for POP. However long-term results of this procedure needs further investigation.

Background

The incidence of pelvic organ prolapse (POP) lies in the range of 1.5-49/10000, although it may vary by several factors, especially age [1]. Women have an estimated 10-20% lifetime risk of undergoing POP repair according to several studies [2, 3]. As a result of the increasing life expectancy, a steadily rising number of POP surgeries will likely be demanded from gynecologists.

POP surgeries are mainly classified into as reconstructive and obliterative methods [2]. The decision on the surgical method depends on a plethora of factors including patient age, overall condition, comorbid disease status, POP severity, and sexual life. Le Fort colpocleisis is one of the obliterative modalities preferred in elderly patients who are no longer sexually active.

Le Fort colpocleisis was first described in 1877 by Leon Le Fort as a surgical procedure which basically involves closing the vagina wherein pubocervical fascia (PCF) and rectovaginal fascia (RVF) are approximated and sown along the midline. Anatomical success rates up to 98% have been reported [4]. A modification to the Le Fort operation was introduced over time by Goodall and Power who described excision of a triangular piece from the vagina to allow for coitus [5].

In the literature, there are not sufficient studies about Le fort colpocleisis that present anatomical and clinical results together. In this study, we have prospectively analyzed Le Fort colpocleisis operations carried out in our department. Here, we have evaluated the anatomical outcomes of the surgery using pelvic organ prolapse quantification (POP-Q) in addition to the clinical outcomes which were assessed through queries on Global Pelvic Floor Bother Questionnaire (GPFBQ).

Methods

Study Design

The study included 59 patients who were diagnosed with vaginal or utero-vaginal prolapse and therefore underwent Le Forte colpocleisis either alone or in combination with other gynecological surgeries during the time period of January 2016 and October 2020. This study has been approved by the Mugla Sitki Kocman University Clinical Research Ethics Committee (Ethics approval date: Jul 02, 2020, No:07/VI). As a part of pre-operative procedure, a detailed medical history was retrieved and gynecological examination was applied to all patients. Before the operation, all the patients were counselled about the desire for future vaginal intercourse. The surgery was planned for the patients with no intention to have any sexual intercourse according to counselling result. Pre-operative and post-operative outpatient follow-up examinations as well as the surgeries were all performed by two surgeons experienced in urogynecology (AAS and MFK). Informed consent was obtained from all participants.

When patients were scheduled for the surgery, queries were conducted to record about age, gravidity, parity, body mass index (BMI), comorbid diseases, history of any previous surgeries, and lower urinary tract symptoms (LUTS). LUTS such as stress urinary incontinence (SUI), frequency, urgency, urinary leakage with urgency, difficulty in urination, bulging of vagina, obstructive defecation, fecal incontinence were assessed by using Turkish validated Global Pelvic Floor Bother Questionnaire (GPFBQ) [6]. Prolapse was graded through POP-Q classification during gynecological examination [7]. Complications were evaluated according to the Clavien-Dindo classification and classified using the joint project of the International Continence Society and the International Urogynecological Association Prosthesis/Graft Complication Classification System [8, 9].

The Surgery

All patients were placed in lithotomy position. Then spinal anesthesia was performed. A rectangular incision was made on the anterior aspect of vaginal wall starting from the level of 0.5 cm distal to the urethral orifice extending until 1 cm is left before reaching the anterior cervical lip. Vaginal mucosa was denuded off the PCF. Then, posterior vaginal wall was also excised in a rectangular shape, initiating from the insertion point of uterosacral ligaments extending until 1 cm is left before the posterior cervical lip. Vaginal mucosa was denuded off the RVF. The edges of lateral residual vaginal mucosal walls were tied using no: 2/0 polyglactin suture forming a drain tunnel. Afterwards, PCF at the anterior wall and RVF at the posterior wall were aligned along vertical plane. Then no: 2/0 polyglactin was used to suture PCF to RVF for vaginal closure (Video-1).

Postoperative Follow-up

Urinary catheter was retracted, and a complete blood count sample was collected 24 h after the surgery. Patients were discharged to home at 48 hours provided no complications have occurred. All patients were inspected at post-operative 1 and 12 months. During the follow-up conducted at our outpatient department 12 months after the surgery, the same set of GPFBQ questioned pre-operatively was re-questioned and the anatomical marker of total vaginal length (TVL) and genital hiatus (Gh) as well as the location called C point, all of which are the measurement parameters included in POP-Q scoring system, were re-evaluated (Table-1).

Statistical Analysis

Statistical analysis was carried out using SPSS software (IBM SPSS Statistics, Version 22.0. Armonk, NY: IBM Corp). Shapiro-Wilk test was applied to assess distribution of variances. Variables with a normal distribution were presented as mean±standard deviation (SD). The comparison of pre-operative and post-operative hemoglobin (Hb) values was accomplished using paired-samples t-test. The relationship of GPFBQ between pre-operative and post-operative groups was analyzed using Chi-square test. Values of $p < 0.05$ were accepted as statistically significant.

Results

A total of 59 patients were included in the study. The average age of the patients was 71.67 ± 7.01 (years). These women had a parity of 3.20 ± 1.12 , on average. Mean BMI was 27.1 ± 9.52 kg/m². Prior surgical history included vaginal hysterectomy + culdoplasty in three patients, cataract in seven patients, and knee prosthesis implantation in four patients. The comorbid diseases of the patients are shown in Table-2. Vaginal hysterectomy in combination with colpocleisis was applied in 22 patients, while 37 patients underwent colpocleisis alone.

Pre-operative mean Hb value of the patients was 12.95 ± 1.54 g/dL compared to a post-operative value of 11.01 ± 1.25 g/dL.

When post-operative complications were classified by seriousness according to Clavien- Dindo classification, grade 1 complication [5.08%- urinary tract infection (UTI)] were noted in three patients and grade 2 complication were noted (3.38%- atelectasis) in two patients.

When occasions of pre-operative versus post-operative symptoms were evaluated, significant differences were found for SU1, frequency, difficulty in urination, and bulging of vagina during post-operative period ($p:0.007$, $p < 0.001$, $p:0.01$, $p < 0.001$, respectively) (Table-3).

Discussion

Le Forte colpocleisis is not only an effective surgical treatment for POP patients but is also favorable for short operative time and low rates of associated complications and morbidity [10, 11]. Colpocleisis is preferred in elderly and fragile patients who are no longer sexually active. In this study, we have compared POP-Q and GPFBQ scores as detected prior to surgery and 12 months after the surgery in the patients who underwent Le Forte colpocleisis in our department. Our analysis revealed statistically significant change in point C, TVL, and Gh measurements at post-operative month 12 compared to the pre-operative measurements as a result of surgery. Although these changes seem clinically insignificant, this result may indicate anatomic recovery. Moreover, among GPFBQ, we have found statistically significant improvement in SUI, frequency, difficulty in urination, and bulging of vagina which implies a positive impact on functional recovery.

Le Forte colpocleisis is mostly applied in elderly women. To this end, the mean age of 325 patients included in the study of Zebede and co-workers was 81.36 ± 5.3 years, and likewise in the study by Reisenauer *et al.* 58 patients had a mean age of 81.9 ± 6.4 years [4, 12]. In our cohort, mean age was 71.67 ± 7.01 years.

According to the literature, Le Forte colpocleisis features as a low-risk and well-tolerated surgery. The reasons for this are most possibly the ease of application as a surgical technique and the short operative time. A lot of publications reported for its intra-operative and post-operative complications. According to the review by FitzGerald and colleagues, post-operative cardiac, thromboembolic, pulmonary, and cerebrovascular complications were detected in almost 5% of the patients. On the other hand, approximately 15% of the patients had experienced minor complications including UTI, vaginal hematoma, cystotomy, fever, and thrombophlebitis [13]. Another study carried out by Hullfish *et al.* detected peri-operative complications in 18 out of 94 patients, most frequent of which was UTI experienced by four patients [14]. In our study, a major complication occurred only in one patient (2.56%) who developed atelectasia and a minor complication occurred in two patients (5.12%), both had UTI. The lower rates of major and minor complications attained in our study are most likely associated to the younger mean age in our sample.

POP-Q scoring system is one of the most widely used methods worldwide for the purposes of classification of and surgery success in POP [15]. Subsequent to a successful colpocleisis, POP-Q scores should improve remarkably. In their study of Reisenauer *et al.*, POP-Q scores have been evaluated in 37 patients [12]. At the same study, mean measurement for TVL was 22 ± 9 mm, for PB was 45 ± 13 mm, and for Gh was 17 ± 6 mm. In another study conducted by Fitzgerald M *et al.*, TVL, Gh, and PB were evaluated pre-operatively and post-operatively [13]. In chronological order of their measurements, mean values for TVL were 9 cm and 3 cm; for Gh were 6 cm and 2 cm; and for PB were 3 cm and 4 cm. In our study pre-operative vs. post-operative mean values for TVL were 8.93 ± 1.73 mm vs. 35.1 ± 12.4 mm, for Gh were 4.83 ± 0.94 mm vs. 4.26 ± 0.94 mm, and for C point were 6.70 ± 2.44 mm vs. -2.66 ± 1.21 mm, respectively. We believe that the anatomical improvement in TVL is arising from the sutures placed in vertical axis and the improvement in C point is a result of vertical closure performed along the free edges of vaginal apex.

Along with the anatomical improvement, functional improvement is also essential following the POP surgery. Various questionnaires are often used to investigate this aspect, such as those on LUTS. In a study by Neimark et al, 45 women underwent Le forte colpocleisis, high perineoplasty and tension-free vaginal tape (TVT) [16]. When the pre-operative and post-operative 3 months results of these cases were evaluated; SUI and post-voiding residual symptoms were significantly decreased, constipation and irritative voiding symptoms did not change. In addition, the patients were administered the post-operative QoL questionnaires, but it is not possible to make a healthy evaluation because the questionnaire is not administered pre-operatively. In the study of Hullfish *et al.*, patient queries were performed after an average of 2.75 years following the surgery [14]. Accordingly, 34 women who had pre-operative urgency and frequency symptoms who were asked whether they consider their condition had improved, two (5.9%) were not sure, one (2.9%) disagreed and remaining women were agreed. Furthermore, of the 34 women who had pre-operative difficulty of emptying their bladder, four (11.8%) were not sure and another four (11.8%) disagreed. On the contrary to the Hullfish *et al.*'s study, our study did not provide a rank of options, but instead yes/no options for SUI, frequency, difficulty of urination, and bulging of vagina improved by post-operative 12 month as stated by our respondents [14]. In addition to the difference in questionnaire methodology, compared to their results, our findings also indicate a higher rate of patient satisfaction. Koski *et al.* have conducted Urinary Distress Inventory-6 on 21 women 9.3 months after on average Le Fort colpocleisis [17]. According to the answers provided by the respondents, 7 (%33.3) women had frequent urination and urge incontinence, 5 (23.8) women had SUI, 4 (19%) women had difficulty in urinary leakage and difficulty emptying. In the results of our study, 1 (%2.56) woman had frequent urination and, none of the women had urge incontinence and urinary leakage, 8 (20.51%) women had SUI, 2 (5.12%) women had difficulty urination. The reason underlying the improvement in LUTS may be the anatomical elimination of anterior or posterior compartment defects.

SUI exerts adverse consequences on social life and physical activities of women, particularly those of advanced age. Its incidence varies by a number of factors with figures reported in the range of 16.1-68.8% [18]. The study by Fitzgerald and colleagues included 152 colpocleisis patients of whom 54% had pre-operative SUI that reduced to 15% post-operatively [19]. Glavind *et al.* have investigated 40 patients for SUI of whom 17 (42.5%) had SUI at pre-operative period, while 7 (17.5%) patients have persisted and one (2.5%) patient had increased SUI during post-operative period [20]. In our patients, pre-operative SUI was detected in 51.28% while 20.51% had SUI at post-operative month 12. The results of the current study are comparable to the results documented in literature. Augmented support to the urethral neck is likely the reason for the improvement we detected in SUI. On the other hand, de novo SUI developed only in one patient.

The entire set of patients were operated in the same center by two surgeons experienced in their field who also followed up the patients post-operatively. This altogether helped standardization of the study data. A strong aspect of this study is that it handles not only anatomic improvement but also improvement in LUTS. Nevertheless, it is limited by its single-center design and small sample size.

Conclusion

Le Fort colpocleisis features out as a surgery with a high rate of anatomical and functional success and low rate of complications preferable in elderly POP patients who are no longer sexually active. In addition to anatomical improvement, the improvement we have achieved in LUTS implies it also provides symptomatic recovery. In order to further demonstrate such recovery, studies with a larger sample size from different backgrounds are needed.

Abbreviations

POP: Pelvic organ prolapse; GPFBQ: Global Pelvic Floor Bother Questionnaire; PCF: Pubocervical fascia; RVF: Rectovaginal fascia; POP-Q: pelvic organ prolapse quantification; BMI: Body mass index; LUTS: Lower urinary tract symptoms; SUI: Stress urinary incontinence; TVL: Total vaginal length; Gh: Genital hiatus; Hb: Hemoglobin; UTI: Urinary tract infection; TVT: Tension-free vaginal tape.

Declarations

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

Acknowledgements

The authors wish to thank the numerous individuals who participated in this study. In addition, the authors thank all the peer reviewers for their opinions and suggestions.

Authors' contributions

MFK conceptualized and designed the study, drafted the initial manuscript, performed operations. BS reviewed and revised the manuscript. IG, DAG designed the data collection instruments, collected data. MOA carried out the initial analyses. AAS performed operations, reviewed and revised the manuscript. Both authors read and approved the final manuscript.

Funding

None.

Availability of data and materials

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

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Muğla Sıtkı Koçman University Faculty of Medicine with a date and number of Jul 02, 2020, No:07/VI. The study was conducted according to the recommendations of Helsinki declaration. Written informed consent was obtained from all patients before undergoing surgery.

Consent for publications

Not applicable.

Competing of interests

M.F.Kıncı, B.Sezgin, M.O.Arslaner, D. Akın Gökbel, İ.Gökbel, A.A.Sivaslıoğlu declare that they have no competing of interests.

Disclosure

None declared.

Financial Support

The funding sources had no involvement in any step of the manuscript.

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Tables

Table 1: Comparison of pre-operative and post-operative POP-Q findings

| | Pre-operative | Post-operative Month 12 | Paired differences (95%CI) | p |
|-----|---------------|-------------------------|----------------------------|--------|
| Aa | 2.23±1.00 | NA | * | <0.001 |
| Ap | 2.40±0.81 | NA | * | |
| Ba | 6.50±2.02 | NA | * | |
| Bp | 6.30±1.96 | NA | * | |
| C | 6.70±2.44 | -2.66 ± 1.21 | 9.36±2.42 (8.46-10.27) | |
| TVL | 8.93±1.73 | 3.51 ± 1.24 | 5.41±2.32 (4.53-6.29) | |
| Gh | 4.83±0.94 | 4.26 ± 0.94 | 0.56±0.72 (0.29-0.83) | |

Table 2: Comorbid diseases of the patients

| | n | % |
|-------------------|----|-------|
| Hypertension | 21 | 35.59 |
| Diabetes Mellitus | 6 | 10.16 |
| Hypothyroidism | 6 | 10.16 |
| Heart Failure | 8 | 13.55 |
| Parkinson | 6 | 10.16 |
| Hyperthyroidism | 3 | 5.08 |

Table 3: Pre-operative and Post-operative (Month 12) Lower Urinary Tract Symptoms

| Lower Urinary Tract Symptoms | Pre-operative | | | Post-operative Month 12 | | | p value |
|------------------------------------|---------------|------|-------|-------------------------|------|-------|------------------|
| | | N | % | | N | % | |
| | | (59) | | | (59) | | |
| Intermittency | No | 47 | 79.66 | No | 58 | 98.3 | 0.11 |
| | Yes | 12 | 20.33 | Yes | 1 | 1.69 | |
| Frequency | No | 31 | 52.54 | No | 57 | 96.61 | <0.001 |
| | Yes | 28 | 47.45 | Yes | 2 | 3.38 | |
| Urgency | No | 47 | 79.66 | No | 58 | 98.3 | 0.11 |
| | Yes | 12 | 20.33 | Yes | 1 | 1.69 | |
| Nocturia | No | 40 | 67.79 | No | 56 | 94.91 | 0.01 |
| | Yes | 19 | 32.2 | Yes | 3 | 5.08 | |
| Pelvic pain | No | 31 | 52.54 | No | 57 | 96.61 | <0.001 |
| | Yes | 28 | 47.45 | Yes | 2 | 3.38 | |
| Emptying | No | 47 | 79.66 | No | 56 | 94.91 | 0.254 |
| | Yes | 12 | 20.33 | Yes | 3 | 5.08 | |
| Stress Urinary Incontinence | No | 29 | 49.15 | No | 47 | 79.66 | 0.007 |
| | Yes | 30 | 50.84 | Yes | 12 | 20.33 | |

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