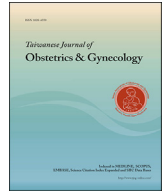




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## Original Article

## Le Fort partial colpocleisis as an effective treatment option for advanced apical prolapse in elderly women

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## ABSTRACT

**Objective:** The aim of this study was to evaluate the outcomes of women with advanced apical prolapse who were treated with the obliterative LeFort partial colpocleisis (LFC) procedure.**Materials and methods:** We reviewed the medical records of patients who underwent LFC for advanced apical prolapse. We collected data for baseline patient characteristics, co-morbidities, severity of prolapse, operating time, intraoperative injuries, and postoperative complications. Subjective post-operative outcomes and patient satisfaction levels were also assessed.**Results:** Ninety-five patients underwent LFC during the study period. Median age of patients at operation was 76.0 years. Mean operation time was 121.5 ± 31.9 min. Mean postoperative hospital stay was 3.5 ± 1.6 days. Postoperative complications, which were virtually all urinary symptoms, were present in 29.8% of patients, and 89.3% of patients have been in spontaneous remission. There was one case with perineal wound infection, one case of prolapse recurrence, and one case of *de novo* rectal prolapse after LFC. The objective success rate of the LFC procedure for all patients was 98.9% (94/95). Most (96%) patients were satisfied with the LFC results and pleased with the improvement in body image.**Conclusion:** The obliterative LFC procedure had a high success rate and was associated with minimal adverse events for the elderly patients with advanced apical prolapse. This procedure should be considered as a treatment option for the advanced apical prolapse in selected elderly women who do not want to conserve vaginal intercourse, as it offers improvement in quality of life and is associated with a low regret rate.© 2019 Taiwan Association of Obstetrics & Gynecology. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

In Korea, the percentage of people aged 65 years and older was estimated to be 35.9% in 2015, indicating it is the world's second oldest country next to Japan (40.1%) [1]. As the size of the aging population grows, aging-related diseases increase concurrently, and the demand for treatment of these diseases is expected to continue to rise until the year 2050 [2]. Among the aging-related diseases, pelvic floor disorders, including pelvic organ prolapse (POP), will become a high priority health issue among older women

because the distorted body image associated with a prolapsed pelvic organ can harm a person's quality of life (QOL), a key indicator of personal wellbeing [3].

The weighted prevalence of POP has been reported to range from 25% to 50% among parous women [4–8]. The etiology of POP is multifactorial. Women in previous generations usually had greater parity and were more likely to give birth at home. Moreover, diseases causing chronic coughing, such as tuberculosis, were more prevalent in previous generations. In addition, a frequent squatting posture, typical of a sedentary lifestyle, was common in previous generations. These conditions, all of which are highly likely to increase a woman's abdominopelvic pressure, have been suggested to be important risk factors for the development of POP [9–12].

Surgical treatment options for POP can be classified as either reconstructive or obliterative techniques. A reconstructive procedure, usually taken after hysterectomy, can restore vaginal depth

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and function. However, for older women who do not seek to maintain coital function, an obliterative technique is an effective alternative procedure for correcting advanced apical prolapse. Le Fort partial colpocleisis (LFC) is a representative obliterative surgical technique that has been used for frail, older women with advanced apical prolapse and who are inappropriate candidates for vaginal reconstructive surgery. LFC has been underused because some gynecologists have indicated that colpocleisis may adversely affect body image, cause regret for loss of coital function, and, ultimately, result in patients being unsatisfied with the procedure. However, as a result of the trend toward increased global aging, the need for surgical treatments appropriate for elderly POP patients has increased. An increasing number of older but otherwise healthy women are choosing obliterative surgery due to its high success rate and quick recovery [13]. However, there is a paucity of information reported on the obliterative LFC procedure. Recent reports on LFC are mostly case series with limited numbers of cases with poorly defined postoperative outcome measures and follow-ups [13,14]. This study was aimed to evaluate outcomes, including patient satisfaction, regret rate, and postoperative complications, among women with advanced apical prolapse who were treated with the obliterative LFC procedure.

## Materials and methods

This is a retrospective cohort study of patients who underwent LFC as a primary or recurrent surgery for advanced apical prolapse. Data from January 2006 to April 2018 were collected from the clinic of the Seoul Metropolitan Government - Seoul National University Boramae Medical Center and the Ilsan Paik Hospital. At each of those two medical centers, LFC was performed by a single, but different, expert surgeon.

We used the Pelvic Organ Prolapse Quantification (POP-Q) system developed in 1996 for the severity criteria to evaluate the severity of apical prolapse [15]. Severity of prolapse was measured by position of maximal extent of the prolapse with the patient standing with her legs spread a shoulder's width apart with a slight bend in the knee. Then, an expert gynecologist did vaginal examination manually while she strains to push the pelvic organ bulging out.

The general operation procedure of the obliterative LFC were as follows: Rectangular shapes on the anterior and posterior vaginal walls are demarcated with a sterile marker; then, the anterior and posterior vaginal epithelial tissue are stripped with sharp dissection and sutured between the edges of each distal quadrangle. Following those actions, the denuded areas are sewn together front-to-back in progressive rows using 2-0 Vicryl® interrupted sutures. Next, the bulged pelvic organ is inserted into the vaginal cavity, leaving a lateral tunnel on each side. For reinforcement of the pelvic floor, levator ani plication and posteriorperineorrhaphy are performed [16,17].

Once the subjects were selected, their medical records were queried for baseline patients' characteristics, as well as perioperative, and postoperative data including co-morbidities, severity of prolapse and postoperative complications. Strict definitions were used to evaluate any perioperative or postoperative adverse events for all patients. Co-morbidities were classified into eight categories: 1) cardiovascular disease including hypertension, angina, and arrhythmia, 2) diabetes mellitus, 3) thyroid disease, 4) liver disease including hepatitis and liver cirrhosis, 5) renal disease, 6) other non-gynecologic cancer, 7) neurologic disease including stroke, subarachnoid hemorrhage (SAH), cerebrovascular attack (CVA), and 8) neuropsychiatric disease including depression and dementia. The severity of prolapse was measured by assessing the position of the maximal extent of the prolapse when the patient was standing with legs spread a shoulder's width apart and with a slight

bend in the knee. With the patient in that position, an expert gynecologist did a manual vaginal examination while the subject strained to push the bulging pelvic organ out.

Operative data were collected from the detailed operative records and included in the analysis. Total operating times (incision to closure), kinds of intraoperative events, and the level of hemoglobin (Hb) drop were evaluated. The Hb drop value was calculated by subtracting the Hb level within three days of surgery from the preoperative Hb level. The length (days) of hospitalization, length (days) indwelling Foley catheter was *in situ*, and types of acute postoperative complications were analyzed.

The objective surgical success was defined as no descent of the vaginal walls beyond the hymen during the follow-up period. Subjective postoperative outcomes and the level of patient satisfaction were assessed by direct interview when the patient visited an outpatient clinic or by the telephone-contact in June 2017. During the interview, the women were asked the following questions regarding patient satisfaction: (1) Do you feel satisfied with the surgical outcome when comparing your current condition with that before surgery? (2) If not, what are the symptoms that made you say so in the daily life? The answers of the respondents were categorized as "very satisfied", "little discomfort but more satisfied than before", or "regret". Those who answered "regret" were asked to identify the problem(s) that bother(ed) them. If a patient was unavailable for an interview, a caregiver for that patient was asked to provide the information. If the caregiver could not provide reliable information for the patient's status, we exclude the information from the analysis.

Data were analyzed by using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA) and values are presented as means  $\pm$  standard deviation, medians, or percentages, depending on the variable.

## Results

Ninety-five patients with advanced apical prolapse underwent LFC. All patients were categorized as stage IV according to the definition of the POP-Q system. Median age of the patients at operation was 76.0 [61–91] years.

Of the 95 patients, uterine prolapse was present in 80 patients, while 15 had vaginal vault prolapse. All patients were sexually inactive and showed normal cervical cytology at a minimum of 12 months prior to surgery. Ninety-seven percent of the patients had at least one or more co-morbidities (Table 1). The numbers (percentages) of patients who had one medical co-morbidity, two co-morbidities, and three and more co-morbidities are 41/95 (43.2%), 32/95 (33.7%), and 12/95 (12.6%), respectively. Among them, one patient had six co-morbidities. Cardiovascular disease (e.g., hypertension, angina, and arrhythmia) and diabetes were the most frequent co-morbidity types, present in 78.9% and 31.6% of the patients, respectively.

The objective success rate of the LFC procedure for all patients was 98.9% (94/95). One patient who underwent LFC for vaginal vault prolapse has experienced another apparent vaginal vault prolapse within one year after the LFC.

Meanduration of the patients' postoperative hospital stay was  $3.5 \pm 1.6$  [1–10] days. Approximately half of the patients (51/95, 53.7%) were discharged within three days after the LFC. Most patients (92/95, 96.9%) were discharged in six days, but three patients continued their stay at the hospital due to non-medical reasons including transportation problems after discharge or family care concerns. Therefore, the true postoperative hospital stay duration is shorter than that shown in Table 2. The mean Hb drop was  $1.8 \pm 1.1$  [–0.4 to 4.8] mg/dL. Mean operation time was  $121.5 \pm 31.9$  [70–225] minutes. The meantime that the indwelling Foley catheter was *in situ* was  $2.0 \pm 2.6$  [1–26] days, and in the majority of

**Table 1**  
Patients characteristics (n = 95).

		Number of patients (%)
Age at operation	60–69	13 (13.7%)
	70–79	55 (57.9%)
	80–89	26 (27.4%)
	90–99	1 (1.05%)
	Median [range] <sup>a</sup>	76.0 [61–91]
Parity	1	5 (5.3%)
	2	17 (17.8%)
	3	24 (25.3%)
	4	32 (33.7%)
	5	10 (10.5%)
	6	7 (7.4%)
Previous POP Management (coexisted 1case)	Hysterectomy	15 (15.8%)
	Pessary insertion	12 (12.6%)
Type of co-morbidity	Cardiovascular disease (HTN, Angina, Arrhythmia)	75 (78.9%)
	Diabetes	30 (31.6%)
	Thyroid disease	7 (7.4%)
	Liver disease (Hepatitis, LC)	3 (3.2%)
	Pulmonary disease (Tb, Asthma)	10 (10.5%)
	Renal disease (CKD)	3 (3.2%)
	Non-gynecologic cancer	5 (5.3%)
	Neurologic disease (Stroke, SAH, CVA)	6 (6.3%)
	Neuropsychiatric disease (Depression, Dementia)	3 (3.2%)
Number of co-morbidities	0	4 (4.2%)
	1	41 (43.2%)
	2	32 (33.7%)
	3	12 (12.6%)
	3<	6 (6.3%)
	Median [range] <sup>a</sup>	2 [0–6]

HTN, hypertension; LC, liver cirrhosis; CKD, chronic kidney disease; SAH, subarachnoid hemorrhage; CVA, cerebrovascular accident.

<sup>a</sup> Values are given as median [range].**Table 2**  
Postoperative outcomes (n = 94).

		Number of patients (%)
Length of Hospitalization (days)	≤3	51 (53.7%)
	4–6	41 (43.2%)
	7–9	2 (2.1%)
	9<	1 (1.1%)
	Mean ± SD [range] <sup>a</sup>	3.5 ± 1.6 [1–10]
Hemoglobin drop (mg/dL)	<1	17 (17.9%)
	1–2	43 (45.3%)
	2–3	24 (25.3%)
	3<	11 (11.6%)
	Mean ± SD [range] <sup>a</sup>	1.8 ± 1.1 [–0.4–4.8]
Operation time (minutes)	70–89	11 (11.6%)
	90–119	37 (38.9%)
	120–149	29 (30.5%)
	150<	18 (18.9%)
	Mean ± SD [range] <sup>a</sup>	121.5 ± 31.9 [70–225]
Length of Foley catheter indwelling (days)	1	40 (42.1%)
	2	47 (49.5%)
	3–4	4 (4.2%)
	over 4	4 (4.2%)
	Mean ± SD [range] <sup>a</sup>	2.0 ± 2.6 [1–26]
Complication (incidence/self-resolution)	Voiding difficulty	5/5
	Urinary retention	3/3
	Urinary frequency	3/3
	Urinary incontinence	7/6
	Nocturia	1/1
	Urinary tract infection	1/1
	Delirium	1/0
	Abdominal pain	1/1
	Rectal prolapse	1/0
	Need for transfusion	2/2
	Constipation	2/2
	Perineal wound infection	1/1
	Total/self-resolution (%)	28/25 (29.8%/89.3%)

<sup>a</sup> Values are given as mean ± SD[range].

patients (87/95, 91.6%) Foley catheters were removed within two days of surgery.

Median follow-up time was  $29.4 \pm 27.0$  [1–108] months. Postoperative urinary symptoms such as urinary incontinence, voiding difficulty, sense of urinary retention, and urinary frequency were present in 29.8% (28/95) of patients, but most cases resolved spontaneously (89.3%, 25/28) (Table 2). Seven patients (7.4%) experienced postoperative urinary incontinence. One of them had prolonged postoperative urinary incontinence, but no additional surgical intervention was performed due to advanced age. In one patient, total vaginal vault prolapse recurred one year after the patient underwent LFC for vaginal vault prolapse. A patient who was suffering from dementia experienced a sudden feeling of vaginal bulging after a vigorous sneeze. Subsequently, the torn vaginal epithelium of the wound surface spontaneously healed and closed with a scar. Another patient experienced rectal prolapse 5 years after receiving the colpocleisis. She then underwent sigmoidectomy and rectopexy.

Regarding the survey of patient satisfaction, 17 patients were unavailable for that survey. Among the 78 patients who were available and underwent LFC, 75 patients (96.2%) said they were “very satisfied” or “more satisfied than before” (Table 3). Three patients (3.8%) responded they “regret” choosing to undergo colpocleisis. The regrets of two of those three patients were due to postoperative complications including rectal prolapse after surgery and recurrence of vault prolapse with the same degree of severity as before the initial surgery. In the third patient, the actual prolapse was not identified, but 3 months after the LFC, the patient was still dissatisfied due to a persistent feeling of a bearing down sensation.

## Discussion

In this study, we have shown that obliterative LFC can be considered a good surgical treatment option for advanced apical prolapse in elderly women who have multiple co-morbidities and do not need to conserve coital activity.

The principal findings of the study were the following: 1) We achieved a high success rate after LFC in elderly women with advanced apical prolapse; 2) Procedure-related perioperative complications were minimal; 3) Patient's subjective satisfaction rate was very high after LFC.

Among the surgical aspects of the treatment of advanced apical prolapse, the obliterative technique has not received as much attention as that of reconstructive techniques such as sacrospinous fixation, abdominal sacral colpopexy, or iliococcygeus fixation because such reconstructive surgery can restore the normal anatomy, while the obliterative procedure is used to correct the prolapse by closing off a portion of the vaginal canal, which inevitably results in the patient losing coital function.

In this study, we present longitudinal data for 95 patients, which is, to our knowledge, a relatively large-scale study of obliterative procedures in Korea, over a follow-up period of up to 12 years after LFC (median follow-up duration 29.4 months). None of the patients showed intraoperative complication. Immediate postoperative complications were minimal and mostly were transient urinary symptoms with one case of perineal wound infection that was completely treated with antibiotics during additional hospitalization. We also described a case of recurrent prolapse after LFC, which was thought to be due to the sudden abdominal pressure associated with a vigorous sneeze, as well as a case of *de novo* rectal prolapse after LFC.

Sung et al. reported that patients with extreme old age who underwent obliterative procedures have a lower risk of complication than did those who underwent reconstructive procedures for prolapse (17.0% vs. 24.7%,  $p < 0.01$ ) [18]. Haim et al. reported that, among 23 patients over 80 years old who underwent colpocleisis, there were no intraoperative complications and only two transient lower urinary tract infections were recorded [18]. Our study also found that after long-term follow-up, patients who underwent LFC expressed little regret. Most of them (96%) were satisfied with the surgery. A retrospective study by Song et al. of 35 women who underwent LFC found that, at the median 5-year follow-up, 33 patients (94.3%) were satisfied with the surgery, with two patients, one of whom suffered postoperative urinary urgency and the other with vaginal hematoma, characterizing themselves as “neither satisfied nor dissatisfied.” [16] The largest study regarding colpocleisis was reported by Zebede et al. and included 310 patients. They reported an anatomical success rate of 98.1% and a subjective satisfaction rate of 92.9% [17].

Women who have undergone POP surgery often experience *de novo* urinary incontinence after surgery, which is referred to as occult stress urinary incontinence (OSUI), and the prevalence of

**Table 3**  
Patient satisfaction (n = 95).

		Number of patients (%)
Length of OPD follow up (month)	≤6	29 (30.5%)
	7–12	7 (7.4%)
	13–24	10 (10.5%)
	24<	49 (51.6%)
	Mean ± SD [range] <sup>a</sup>	$29.4 \pm 27.0$ [0–108]
Time from surgery to interview (month)	≤6	10 (10.5%)
	7–12	6 (6.3%)
	13–24	10 (10.5%)
	24<	52 (54.7%)
	Not available to contact	17 (17.9%)
Patient interview type	Mean ± SD [range] <sup>a</sup>	$35.0 \pm 24.8$ [0–98]
	Direct interview	64 (75.3%)
	Telephone (Patient)	2 (2.4%)
	Telephone (Care giver)	12 (14.1%)
	Not available to contact	17 (17.9%)
Patient satisfaction	Very satisfied	70/78 (89.8%)
	Little discomfort, but more satisfied than before	5/78 (6.4%)
	Regret	3/78 (3.8%)
	No available information	17/95 (17.9%)

OPD, outpatient department.

<sup>a</sup> Values are given as mean ± SD [range].

OSUI in women with severe POP varied from 9.9% to 68% in previous reports [19–22]. Urethral kinking or external urethral compression are well-known underlying causes of OSUI [23]. However, due to the lower degree of damage to the bladder nerve in the course of the LFC surgical procedure, if any types of urinary symptoms occur, the majority of symptoms would be transient and self-resolved. In our study, six of seven patients with *de novo* urinary incontinence after LFC were classified as mild and did not require surgical treatment. One patient who experienced urinary incontinence underwent anti-incontinence surgery. In our study, one patient experienced *de novo* rectal prolapse 5 years after LFC. Thereafter, this patient underwent sigmoidectomy and rectopexy. The development of postoperative rectal prolapses, as occurred in one subject in this study, has been reported previously [24–26]. Pechmann et al. reported two cases of rectal prolapse (2.2%) in 92 patients who underwent total colpocleisis. They suggested a potential mechanism for the development of rectal prolapse in which colpocleisis with levator plication uses the dysfunctional pelvic floor musculature as a physical barrier to visceral descent by narrowing the levator hiatus. Consequently, repairing one area of the pelvic floor may result in provoking a defect in another area with intra-abdominal pressures finding the path of least resistance in the remaining anorectal hiatus [27].

The result of this study revealed that medical co-morbidities should not be considered a major concern in the treatment of POP in these elderly women. The prevalence of medical co-morbidities is high in elderly women, and our study showed that 52.6% of patients had two or more medical co-morbidities, which is similar to that reported in previous studies [17,28,29]. Nevertheless, no mortality related to the surgery occurred among the patients.

In contrast, the Zebede et al. study of 325 elderly women reported a 1.3% mortality rate within 3 months after the colpocleisis operation [17]. These included two pulmonary emboli, one myocardial infarction, and one sepsis as the causes of mortality. Thus, post-operative morbidity and mortality prevention can be major issues in an elderly surgical population.

In our study, the mean operation time was 121.5 min (70–225 min) and the immediate postoperative mean Hb drop was 1.8 mg/dL (0.4–4.8 mg/dL). Ghezzi et al. compared various pelvic reconstructive surgical methods in 138 elderly women and showed that obliterative colpocleisis had a shorter operation time and less estimated blood loss compared with surgery involving vaginal hysterectomy with or without colporrhaphy [29].

In addition to precluding vaginal intercourse, another major disadvantage of colpocleisis is the limited ability to evaluate the cervix, uterus, or ovaries through the vaginal route postoperatively, which, at times, may delay the diagnosis of a gynecologic malignancy [4,30]. Therefore, careful transvaginal ultrasonographic examination and cervical cytological testing are mandatory before planning colpocleisis.

The ideal candidate for LFC is a woman who has complete uterine or vaginal vault prolapse characterized by symmetric eversion of the anterior and posterior vaginal walls. Therefore, in patients with asymmetric anterior vaginal prolapse, a reconstructive surgical method should be the initial recommended approach.

There are some limitations to our study. First, this is a non-comparative descriptive study that involved a lack of thorough postoperative assessment due to patients' poor mobility and poor access to medical services. Second, the data was collected by two different surgeons at two different medical centers, thus there might be non-coherence of outcomes. Third, all patients who underwent this surgery were older than 60 year old, and therefore some patients who lack of sufficient post-operative follow-up were included in analysis. Lastly, we did not use validated questionnaires to perform the outcome assessments because the majority of participants in this study were elderly women that could not easily

read and respond to the questionnaire. Nevertheless, the strength of this study is that our study had a sufficiently long follow-up period (>2 years) after LFC.

In conclusion, our study has demonstrated that LFC can result in a high subjective success rate and a high subjective satisfaction rate. The results also show that obliterative LFC can be considered a good surgical treatment option for the management of POP in selected elderly women that have multiple co-morbidities and do not need to conserve vaginal intercourse. An obliterative procedure for POP remains the least invasive and the most durable surgical repair available [31].

## Conflicts of interest

No potential conflict of interest relevant to this article was reported.

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