Clitoral Phimosis: Effects on Female Sexual Function and Surgical Treatment Outcomes

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ABSTRACT

Background: Surgery is the optimal treatment for a severe form of clitoral phimosis (CP) that is initiated by lichen sclerosus (LS) and causes female sexual dysfunction.

Aim: We aimed to determine the etiology of clitoral phimosis, its influence on sexual function, and outcomes after surgical treatment.

Methods: In this prospective cohort study, we observed the occurrence of clitoral phimosis and related changes in a group of 3,650 sexually active heterosexual women with a mean age of 34.8 ± 14.9 years (20–45 years) from September 2014 to September 2016. Ultimately, we compared the changes in sexual function and distress and satisfaction with postoperative genital appearance in 9 patients with severe clitoral phimosis at 12 months after surgical treatment.

Main Outcome Measures: Sexual function was evaluated using the Female Sexual Distress Scale—Revised and the Female Sexual Function Index, and the patient’s genital self-image was evaluated using the Female Genital Self-Image Scale; gynecologic examinations were performed on all patients.

Results: Various forms of CP were found in 46 of 3,650 patients (1.3%). Severe forms of CP were found in 9 cases, but it was complicated by stenosis of vaginal introitus in only 2 cases. These 9 patients underwent circumcision, and 2 of them underwent perineoplasty. Female sexual dysfunction occurred mainly in those with LS and severe forms of phimosis. Sexual function, as indicated by the total Female Sexual Function Index score, was significantly improved at 12 months after surgery (17.9 ± 0.9 vs 26.6 ± 0.5; P < .001). The Female Genital Self-Image Scale score assessing genital perception was significantly higher after surgery than before in women who underwent clitoral circumcision (20 ± 3.0 vs 12.3 ± 3.3; P < .001). The Female Sexual Distress Scale—Revised score was significantly lower after surgery than before (21.3 ± 6.2 vs 33.8 ± 6.9; P < .001). Sexual function in 2 women with CP and stenosis of vaginal introitus improved after surgery, but the sexual distress level did not decrease significantly.

Clinical Implications: The results of this study will help clinicians to centralize treatment methods and advise patients on the management of clitoral phimosis.

Strengths & Limitations: This is a study evaluating postoperative results of sexual function, distress, and satisfaction with genitalia in women with severe CP, using validated questionnaires. However, the small number of patients and the absence of an appropriate control group are limitations.

Clitoral phimosis (CP) is a congenital or acquired, acute or chronic condition in which retraction of the clitoral hood is fully or partially disabled. CP may be mild, moderate, or severe based on its stage. CP may be asymptomatic or it can cause significant physical issues. Severe CP is most often caused by lichen sclerosus (LS), but it may also occur secondary to untreated inflammation, trauma, or obstetric delivery. LS leads to emotional and physical problems, including female sexual dysfunction (FSD) and reduced frequency of intercourse. The prevalence of LS in women is between 1 of 70 and 1 of 1,000, and it affects more women than men at a ratio of 10 to 1. The etiology of LS is unclear and most likely multifactorial, with genetic and autoimmune factors playing significant roles.

Early-stage LS does not necessarily present with specific skin abnormalities, but it may present with nonspecific itching or burning sensations, dysuria, or superficial dyspareunia. The manifestations of late-stage LS include chronic inflammatory conditions such as hypopigmentation, skin atrophy, erythema, and purpura. The loss of foreskin elasticity may cause balanitis, because of closed compartment syndrome, adhesions, or smegmatic pseudocysts. LS may cause discomfort in the clitoral region, with tenderness, irritation, pain, pruritus, voiding dysfunction, and loss of clitoral sensitivity. Scarring of the genitalia, stenosis of the vaginal introitus, labial resorption, and recurrent tearing during intercourse (vulvar granuloma fissuratum) may occur in advanced stages of LS. LS is considered precancerous and could develop into vulvar carcinoma in 3-5% of patients. The data on the prevalence of CP are inconsistent. Munarriz et al. identified CP in 1 of every 5 patients (22%) in a cohort of 250 female patients treated for FSD. Wiesmeier et al. stated that various stages of CP occur in almost one-third of symptom-free women (n = 589). The potential psychosexual problems in women with CP include aparenuea, dyspareunia, anorgasmia, low sexual desire, low coital frequency, anxiety, guilty feelings, or altered body image. The first-line treatment option for women with CP or SVI caused by LS, ideally initiated before scarring occurs, is localized therapy with ultrapotent corticosteroids. Topical calcineurin inhibitors, retinoids, sedating agents, topical laser therapy (photodynamic therapy), ultraviolet phototherapy, cryotherapy, and laser vaporization are used as second-line therapies. Smegmatic pseudocysts, vulvar granuloma fissurata, or severe CP causing complications are indications for surgical treatment. Although severe forms of CP due to LS may cause FSD, only a few studies have evaluated patient satisfaction after surgical treatment in large patient cohorts. The aim of our research was to determine the etiology of CP, the underlying extent of clitoral involvement and stenosis of the vaginal introitus, and the effect of CP on FSD, sexual distress, and the perception of one’s own genitalia. We aimed to identify any changes in sexual function and sexual distress after surgical treatment. Furthermore, we also examined postoperative complications and the incidence of recurrent illness in the external genitalia.

Materials and Methods

Patients

In this prospective cohort study, we observed the occurrences of CP and related vulvar changes in a group of 3,650 heterosexual women with a mean age of 34.8 ± 14.9 (20-45) years from September 2014—September 2016. A total of 1,820 women with no sexual problems from a urogynecologic clinic and 1,830 patients with various types of FSD or other sexual problems (for instance, relationship discord) from a sexologic clinic were examined. The study included fertile women, with no signs of estrogen deficiency, having penile-vaginal intercourse with a current partner, and who were not pregnant at the time of the study but who had at least 1 delivery. Women with severe or malignant disease were excluded.

Ethical Considerations

This study was approved by our local institutional ethical board. All of the patients provided written informed consent.

Clinical Evaluations

Every woman underwent a gynecologic examination (examination of the vagina using a speculum). We focused primarily on evaluating the external genitalia (the labia majora and minora, labial adhesions, clitoris, preputium, urinary meatus, and perineum). The condition and appearance of the skin and mucous membranes, evidence of estrogenized tissues, vaginal discharge, strictures, scarring, and signs of stenosis of the vaginal introitus were assessed. If CP was identified, the patients were subsequently examined by 2 gynecologists who determined the extent of CP. The length of the vagina in women was measured from the introitus (approximately at the level of the hymenal ring) to the posterior vaginal fornix. Vaginal spaciousness was estimated based on the possibility of insertion of a plastic phantom of 1-2 cm size. The condition of the clitoris was considered abnormal when cranial traction resulted in varying degrees of incomplete foreskin retraction and limited the exposure of the glans clitoridis. The degree of the adherence of the clitoral hood was determined based on whether we could visualize the glans and sulcus of the clitoris. We classified mild (<50% coverage of the glans clitoridis), moderate (<75% coverage of the glans clitoridis), and severe (100% coverage of the glans clitoridis) CP in each patient. The spaciousness of the vaginal introitus was evaluated according to the patients’ subjective feelings about vaginal-penile disproportion during coitus, by the number of fingers that could be inserted during a vaginal examination, and by tissue elasticity. The degree of vaginal introitus dilatation was determined precisely using a set of plastic phantoms with diameters ranging from 1-6 cm.
Figure 1. Management of treatment of women with severe CP or SVI not responding to non-surgical treatment. CP = clitoral phimosis; SVI = stenosis of the vaginal introitus.
Nonsurgical Treatment
We used topical corticosteroids (TCS) as the first-line treatment to achieve remission of LS. The initial TCS treatment took 6 weeks in our study and was dependent on the severity of hyperkeratosis as follows: for mild LS, a mid-potency TCS (methylprednisolone aceponate ointment, 0.1%) was applied once daily; for moderate LS, a superpotent TCS (betamethasone dipropionate ointment, 0.05%) was prescribed once daily; and for severe LS, ultrapotent TCS (clobetasol propionate ointment, 0.05%) was applied once or twice daily. If the symptoms and skin color and texture were not normalized, we continued with the same TCS application for an additional 3–6 months. If we observed that the treatment had no effect, we proposed a surgical solution to those patients with the severe form of CP. 1 month before the planned surgery, TCS treatment was discontinued.

Surgical Procedures
The extent of the surgical procedure (adhesiolysis, dissection and circumcision of the preputial hood, or perineoplasty) depended on the severity of the abnormality in the tissues affected by LS. A biopsy of the underlying tissue was performed before surgery to diagnose the patient’s condition histopathologically. Circumcision of the clitoris was performed with a CO2 laser (CO2 Laser SmartXide2 Deka M.E.L.A. srl, Italy) under general anesthesia. We used the pulse mode on the CO2 laser at 10 watts with 200 millijoules per pulse.

After disinfecting the surgical area, the surgeon made an incision in the midline of the obliterated preputial pouch, protecting glans clitoridis from laser damage using glass rods. The glans clitoridis was visualized. Then, the right and left lateral parts of the preputium were resected, and the glans clitoridis was released. After the laser dissection, the periclitoral skin was oversewn using 6/0 stitches placed in a manner similar to the classical technique for clitoral circumcision. In patients with stenosis of the vaginal introitus, the affected perineal skin and an adjacent part of the posterior vaginal wall were excised. Then, the vaginal flap was drawn down and sutured to the skin margin to cover the defect. Vaseline gauze was applied to the surgical wound area, and an ice pack was placed at the site to reduce swelling. Topical corticosteroids were administered after the sutured scar was healed to prevent postoperative re-agglutination. The patients were recommended to manually rehabilitate the area of the preputial hood and, in case of SVI, to use mechanical vaginal dilators (Figure 1). The patients were observed at intervals based on their clinical conditions, their sexual function, and their distress level. Self-assessments of the genitalia were finally evaluated at 12 months after surgery.

Questionnaires
The following standardized questionnaires were used to assess the mutual links between sexual function, sexual distress, and self-perception about genital self-image: the Female Sexual Distress Scale-Revised (FSDS-R), the Female Sexual Function Index (FSFI), and the patient’s genital self-image was evaluated using the Female Genital Self-Image Scale (FGSIS).21,22 The patients filled in the questionnaires 1 month before surgery and 12 months after surgery. The cutoff score used for the 13-item FSDS-R was 11, with lower values indicating less distress. A previously reported cutoff of 26.55 was used for the total FSFI score,23 with lower values representing possible sexual dysfunction. The 7-item FGSIS was used to evaluate the women’s feelings about their genitalia, with a total score ranging from 7–28. Higher scores indicated a more positive image of the genitalia.

Statistical Analyses
The statistical analysis was performed using SPSS software version 23.0 (SPSS Inc, Chicago, IL, USA). P values < .05 were considered statistically significant. All statistical tests were 2-tailed. Variables that were not normally distributed (Shapiro-Wilk test, P < .05) were analyzed using the Wilcoxon Mann-Whitney rank sum test. The differences between the patients’ preoperative and postoperative conditions in terms of psychosexual variables were evaluated using t-tests.

RESULTS
Characteristics of the Patient Cohorts and the Prevalence, Forms, and Manifestations of CP
All forms of CP were observed in 46 of 3,650 women (1.3%) (Table 1). Severe clitoral phimosis was caused by LS in most cases (8/9) in our study. In 2 of the 9 patients, phimosis was complicated by stenosis of the vaginal introitus, with a maximum diameter of a 2.5 cm. Only in 1 case was phimosis the result of postpartum inflammation. The average age of these 9 women with severe CP was 36.2 ± 4.4 years (range 32–41). They had 1.6 ± 0.5 children (range 1–2), and their mean body mass index was 26.3 ± 4.6. The general characteristics of the women and information on the presence of CP are presented in Table 2.

All women with the severe form of CP (n = 9) had FSD (low desire, low arousal, poor lubrication, pain, anorgasmia, or

| Table 1. Presence of CP in a group of patients from urogynecologic practice and a group of patients from sexologic practice |
|------------------|------------------|------------------|
| Patients from urogynecologic practice | Patients from sexologic practice | Total number |
| Number of patients | 1,820 | 1,830 | 3,650 |
| Women with CP | 3 (6.5%) | 43 (93.5%) | 46 (100%) |
| Mild | 2 (4.3%) | 29 (63%) | 31 (67.4%) |
| Moderate | 1 (2.2%) | 5 (10.9%) | 6 (13%) |
| Severe | 0 (0%) | 9 (19.6%) | 9 (19.6%) |
| SVI | 0 | 2 | 0 |

CP = clitoral phimosis; SVI = stenosis of the vaginal introitus.
### Table 2. The general characteristics of women treated surgically for CP (eventually with SVI)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Diagnosis</th>
<th>Etiology</th>
<th>Length of time suffering from severe CP (mean ± SD, y)</th>
<th>Age (mean ± SD)</th>
<th>BMI (mean ± SD)</th>
<th>Parity (mean ± SD)</th>
<th>LCSP (mean ± SD)</th>
<th>TSP (mean ± SD)</th>
<th>Operation</th>
<th>Postop complications</th>
<th>Recurrence (months after surgery)</th>
<th>Solutions for recurrence</th>
<th>12-month follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CP</td>
<td>LS</td>
<td>4</td>
<td>33</td>
<td>20</td>
<td>1.6 ± 0.5</td>
<td>4</td>
<td>3.4 ± 1.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>2</td>
<td>CP</td>
<td>PPA</td>
<td>3</td>
<td>32</td>
<td>30</td>
<td>2.2 ± 0.6</td>
<td>6</td>
<td>4.7 ± 1.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>3</td>
<td>CP</td>
<td>LS</td>
<td>4</td>
<td>40</td>
<td>28</td>
<td>2 ± 0.5</td>
<td>2</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>4</td>
<td>CP</td>
<td>LS</td>
<td>2</td>
<td>36</td>
<td>19</td>
<td>1.6 ± 0.5</td>
<td>1</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>5</td>
<td>CP</td>
<td>LS</td>
<td>6</td>
<td>30</td>
<td>32</td>
<td>2.2 ± 0.6</td>
<td>2</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>6</td>
<td>CP</td>
<td>LS</td>
<td>9</td>
<td>41</td>
<td>24</td>
<td>1.6 ± 0.5</td>
<td>1</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>7</td>
<td>CP</td>
<td>LS</td>
<td>6</td>
<td>33</td>
<td>25</td>
<td>1.6 ± 0.5</td>
<td>2</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>8</td>
<td>CP</td>
<td>LS</td>
<td>6</td>
<td>40</td>
<td>29</td>
<td>1.6 ± 0.5</td>
<td>2</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Lysis of the adhesions</td>
<td>NF</td>
</tr>
<tr>
<td>9</td>
<td>CP</td>
<td>LS</td>
<td>5</td>
<td>41</td>
<td>30</td>
<td>1.6 ± 0.5</td>
<td>1</td>
<td>3.0 ± 2.5</td>
<td>Circumcision</td>
<td>0</td>
<td>0</td>
<td>Reoperation SVI</td>
<td>NF</td>
</tr>
</tbody>
</table>

BMI = body mass index; CP = clitoral phimosis; LCSP = length of current sexual partnership (years); NF = normal finding; PPA = postpartum postinflammatory agglutination; SVI = stenosis of the vaginal introitus; TSP = total number of sexual partners.
dyspareunia). Their mean FSFI was 17.9 ± 0.9. The disease manifestations included skin irregularities (atrophy, hypopigmentation, or erythema) that caused pruritus, discomfort, burning, itching, and pain. Women with the severe form (n = 9) underwent surgical interventions (dissection of the CP and circumcision, if necessary, with perineoplasty), after which their sexual function significantly improved. The patients with moderate CP (n = 6) anamnesis had delivery injuries in the clitoral area with complicated healing. In the case of the 31 women with mild CP, CP existed without chronic inflammation or atrophic tissue, was asymptomatic, did not require therapy, and was not the cause of sexual pain problems. These were patients from the sexological practice who did not have only female sexual dysfunction but faced other issues, such as relationship discord and were seeking a solution.

Surgical Treatment of CP

Results and Complications

Nine patients aged 36.2 ± 6.1 years (range 32–41) suffering from severe CP for 5.0 ± 2.1 years (range 2–9) underwent surgical treatment using the CO2 laser (Figure 2). A preoperative biopsy verified that eight of these women (88.9%) had LS (Figure 3).

Two patients with LS and stenosis of the vaginal introitus underwent perineoplasty to correct narrowing of the vaginal introitus so that insertion of a 5-cm in diameter phantom (Figure 4) would be possible. Early postoperative complications were not seen (Table 2). Recurrence of illness was identified in three patients (33.3%). In 2 patients, at 8 and 9 months after surgery, a thin filmy adhesion between the glans clitoridis and preputium appeared and re-agglutination of the preputial hood occurred, resulting in 30–50% coverage of the glans clitoridis. With the patients under general anesthesia, the adhesions were lysed bluntly using a small surgical probe and a partially sharpened scalpel. In a third patient, 10 months after surgery for CP and a perineoplasty due to repeated episodes of SVI that narrowed the introitus to a diameter of 3 cm, the dissection had a good effect on the CP. Therefore, we reoperated on the stenosis, which was again expanded so that the vagina could be freely dilated to a diameter of 5 cm. 12 months after the primary surgery, all patients experienced healing without phimosis, the vaginal introitus was freely penetrated, and the women could have sexual intercourse.

Comparison of Sexual Function, Distress, and Self-Evaluation of the Genitalia Before and 12 Months After Surgery

All 9 patients with the severe form of CP complained of low sexual desire and dyspareunia before surgery, 7 (77.8%) could not achieve orgasm, and 4 (44.4%) complained of intermittent lack of lubrication. Their mean coital frequency was 1.5 ± 1.0 times per month (range 1–4). 12 months after surgery, the libido of all the surgically treated women had improved, 3 women were better able to achieve orgasm, and only 1 patient complained of dyspareunia. The characteristics and degree of lubrication did not change. The patients’ coital frequency increased after surgery to an average of 4 ± 1.7 times (range 2–7) per month.

Sexual function, as indicated by the total FSFI score, showed a clear, significant improvement from preoperatively to
postoperatively (17.9 ± 0.9 vs 26.6 ± 0.5; \textit{P} < .001). This improvement was also reflected in higher postoperative scores in the individual domains, except for the lubrication category, in which there was no change. The FGSI assessment score for genital perception was significantly higher in women after circumcision than it was before (20 ± 3.0 vs 12.3 ± 3.3; \textit{P} < .001). The operation clearly improved the patients’ feelings of satisfaction with the appearance of their genitalia. The FSDS-R score was significantly lower after surgery than it was before (21.3 ± 6.2 vs 33.8 ± 6.9; \textit{P} < .001), indicating that women felt significantly less sexual discomfort and distress after undergoing surgery for CP than they did before surgery, although these values were not over the cutoff (11) for the FSDS-R (Table 3). Based on the total FSFI score, 6 women were moved (after surgery) from the dysfunctional to the normal sexual function category, including 2 patients with combined CP and SVI. Sexual function in the remaining 3 women improved as well but was not evidenced by significant differences in the FSFI.

Comparison of Sexual Function to the Level of Sexual Distress in Women With CP, and CP+SVI Before and After Surgery

Sexual function (FSFI) in women with CP (n = 7) compared with that in women with CP+SVI (n = 2) was not significantly different before and after surgery (before the surgery it was dysfunctional in both groups and after surgery it was in the physiological range). However, sexual distress levels (FSDS-R) were significantly higher in women with CP+SVI before and after surgery than in women with CP only (Table 4).

DISCUSSION

Our research confirmed that the severe form of CP is primarily caused by LS and causes FSD in all cases. The asymptomatic mild and moderate forms of CP are reported most frequently, but these rarely cause FSD. In our study population, surgical treatment of the severe form of CP caused by LS is successful and improves sexual function. However, up to 30% of patients suffer from recurrent underlying clitoral and surrounding tissue dysfunction and require reoperation.

Clitoral Phimosis

Occurrence and Influence on FSD

FSD caused by CP and LS affecting the surrounding tissues occurs because of disturbances to the morphologic structure, function, and sensitivity of the genitalia, as well as the patient’s negative perception of her genitalia (vulvar scarring, labial resorption, atrophy). Psychogenic factors and the patient’s self-evaluation of her genital esthetics, as well as organic reasons, can cause anxiety, distress, depression, and decreased sexual appetite. There are inconsistent data on the prevalence of CP. In our group of 3,650 patients, clitoral complications were seen in 1.3% (n = 46). This statement roughly corresponds to the LS prevalence of 1 of 603 or 1 of 30 among the older female population.25 Even though Wiesmeier et al15 found a prevalence of 30% of women with CP in their retrospective study, only 4% had the severe form of clitoral phimosis. According to the Centers for Vulvovaginal Diseases, LS occurs in 7–26% of women.3 The severe form of CP almost always causes FSD, and milder forms without LS are not reported by women to be a disorder, because these forms do not cause any problems. When comparing the group of women with severe and other forms of CP, we did not find significant differences among their parity, age, and body mass index.

Indications for the Surgical Treatment of CP

The more severe forms of CP that cause problems and do not respond to conservative therapy are indicated for surgical treatment. Minor adhesions may occur in asymptomatic women, for whom treatment is not necessary.15 The surgical method (laser vs the classic technique) and extent (full or partial circumcision), variants, and prevention of recurrence differ according to the experiences of various clinics. Surgical correction of LS-related CP and the neighboring structures of the external genitalia is not a complete solution because we do not know the exact etiology of LS. However, it does eliminate the symptoms. The chronic, inflammatory changes caused by LS mostly lead to full obliteration of the preputial hood. Accumulation of smegma may initiate acute smegmatic pseudocysts that can become infected and in turn develop into abscesses that require rapid solutions (“hoodectomy”).25

Figure 4. Dissection of a clitoris phimosis and perineoplasty to correct narrowing of the introitus. (Panel a) Before treatment. (Panel b) 3 weeks after circumcision and perineoplasty. (Panel c) 12 months after treatment. Figure 4 is available in color online at www.jsm.jsexmed.org.
Table 3. The FSFI, FSDS-R, and FGSIS scores of patients before and after surgery

<table>
<thead>
<tr>
<th></th>
<th>Patients (n = 9) before operation (mean ± SD)</th>
<th>Patients (n = 9) after operation (mean ± SD)</th>
<th>Differences</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSFI</td>
<td></td>
<td></td>
<td>t = -15.6, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Desire</td>
<td>1.5 ± 0.3</td>
<td>4.1 ± 0.2</td>
<td>t = -77, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Arousal</td>
<td>2.1 ± 0.6</td>
<td>4.4 ± 0.4</td>
<td>t = -164, df = 16</td>
<td>.871</td>
</tr>
<tr>
<td>Lubrication</td>
<td>3.3 ± 0.5</td>
<td>3.3 ± 0.4</td>
<td>t = -3.9, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Orgasm</td>
<td>3.0 ± 0.5</td>
<td>4.8 ± 0.1</td>
<td>t = -6.8, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>2.4 ± 0.9</td>
<td>5.2 ± 0.1</td>
<td>t = 6.9, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Comfort</td>
<td>5.6 ± 0.2</td>
<td>4.8 ± 1.1</td>
<td>t = 3.9, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>Total score</td>
<td>17.9 ± 0.9</td>
<td>26.6 ± 0.5</td>
<td>t = -23.6, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>FSFI</td>
<td>33.8 ± 6.9</td>
<td>21.3 ± 6.2</td>
<td>t = 3.9, df = 16</td>
<td>.001*</td>
</tr>
<tr>
<td>FGSIS</td>
<td>12.3 ± 3.3</td>
<td>20 ± 3.0</td>
<td>t = -5.1, df = 16</td>
<td>.001*</td>
</tr>
</tbody>
</table>

df = degrees of freedom; FSFI = Female Sexual Function Index; FSDS-R = Female Sexual Distress Scale-Revised; FGSIS = Female Genital Self Image Scale.
*Significant difference from the control group, P < .05.

The Possibilities and Aims of the Surgical Treatment of CP

The goal of surgery is to restore sexual function and the appearance of the genitalia, eliminate symptoms, and visualize the clitoris. Disposal of the underlying tissue usually does not solve the problem of LS permanently. Surgical CO2 laser or use of bipolar radiofrequency wire cold cutting bipolar electrodes are effective methods of treatment of CP. Both of these techniques allow the surgeon to cut tissue into very tiny slices and perform fine dissection with minimal bleeding, better retraction of the tissues, better hemostasis, less scarring, and without causing damage to the clitoris.26,27

Corticosteroids were applied to prevent recurrence only after the incisions were fully healed. The use of corticosteroids is considered very important28; however, their early postoperative use may increase the risk of dehiscence and postoperative infection.17 The evaluation of phimosis recurrence and other LS symptoms depends on the time elapsed since surgery. At 1 year after surgery in our study, none of the patients had serious problems. However, we had resolved 2 cases of relapse of the mild and moderate forms of CP and 1 case of recurrent stenosis of the vaginal introitus.

Results of the Surgical Treatment of CP in Terms of Improvement of Sexual Function

Most studies state that surgical treatment decreases a patient’s negative feelings and improves sexual function.3,10,20,29 Primarily, those patients reported improved clitoral sensation and achievement of orgasm, as well as decreased pain during coitus.13 Our study confirmed these facts. No patient had painful sexual intercourse, and 3 women were able to achieve orgasm. Improved sexual function occurred because of renewal of the anatomic structures, improved function and sensitivity, and the cosmetic effects of surgery. The restoration of self-confidence and a positive relationship with one’s own genitalia led to improvements in overall sexual satisfaction.

Changes in Sexual Function and Sexual Distress Among Women With CP and Women With CP+SVI After Surgery

Although sexual function among women with CP and women with CP+SVI was dysfunctional before surgery but showed significant improvement after, the level of sexual distress (according FSDS-R) only changed among women with CP (even though it was still considered dysfunctional). In women with CP+SVI, the level of distress did not show significant changes. Sexual function improved significantly after surgery in both groups; however, sexual distress decreased only in the group of women with isolated CP. SVI associated with the impossibility of vaginal intercourse is likely more stressful than CP alone.
However, because it was only a very small number of women, it is difficult to make any significant statistical conclusion.

**Other Aspects of Female Sexual Surgery in Relation to Clinical Practice**

The specialists who deal with FSD should be educated and made aware that a thorough physical examination of the genitalia, including the clitoral region, should be performed in all patients with genital and sexual complaints. If TCS or any other treatment method (for instance, radiofrequency laser or dilation in case of SVI) fails, a surgical solution should be considered. Although laser therapy is more expensive, according to our experience, it has a lower rate of complications and results in better healing of the tissues than classic surgery. Prevention of recurrence, postoperative therapy, and multidisciplinary cooperation within holistic, somatic, and psychosocial approaches are important for successful treatment.

**Limitations of the Study**

Our study was limited by the small number of women who underwent surgery and were not compared with a control group of healthy women. However, statistically reviewed data on preoperative and postoperative sexual function were included, using validated instruments to assess sexual function and evaluating the histologic diagnoses. The small number of patients limited our ability to compare the characteristics of severe phimosis caused by LS (especially with or without additional SVI) to the characteristics of severe phimosis due to other causes (congenital, postpartum, and posttraumatic). Other causes of CP could have varying effects on the manifestation and development of sexual dysfunction. This study should be complemented by long-term follow-up studies. In the future, there is a need for studies including a larger number of patients and a longer postoperative follow-up period.

**CONCLUSION**

The severe form of CP inflicted by LS causes sexual problems in most cases. Mild and moderate CP in most cases did not correlate with FSD. In women with CP and FSD caused by LS, in whom local corticosteroid therapy has failed, a surgical solution should be considered. In our study, the surgical procedure not only corrected the anatomic changes, but also reduced the sexual complaints. Circumcision of the clitoris is currently the most effective treatment for the severe form of CP caused by LS, even though recurrence may still occur in the future.

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