

# Psychological epidemiology of sexual function change after conization for cervical dysplasia

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## Summary

**Purpose of investigation:** To evaluate psychological impact of sexual function change after conization for cervical dysplasia. **Materials and Method:** Seventy-seven sexually active women enrolled in this study. Before conization, each participant's sexual function was assessed using the Female Sexual Function Index (FSFI) and trait anxiety was assessed. At least six months after surgery, each woman again completed the questionnaires. The authors compared the results before and after conization according to anxiety. **Results:** The patients with anxiety towards sex after conization had changes in all aspects of sexual function versus those without anxiety for sex ( $p < 0.05$ ). Patients with mild trait anxiety showed sexual function changes in arousal, orgasm, dyspareunia, and satisfaction compared to those without trait anxiety. **Conclusion:** Changes in sexual function after conization are more pronounced in patients who express anxiety regarding sex, or have a trait anxiety, compared to those without anxiety. Therefore, psychological counseling should be emphasized before conization.

**Key words:** Conization; Psychological; Sexual function; Cervical dysplasia.

## Introduction

Conization of the cervix is defined as excision of a cone-shaped or cylindrical wedge from the uterine cervix that includes the transformation zone and all or a portion of the endocervical canal. Conization is used for the definitive diagnosis of cervical intraepithelial neoplasia (CIN), for excluding microinvasive carcinomas, and for conservative treatment of CIN2 or 3. The procedure can be performed with a cold-knife, laser, or electrosurgical loop in a loop electrosurgical excision procedure (LEEP). Conization removes densely innervated cervical tissue that plays a role in sexual satisfaction [1].

Few reports have investigated sexual function after conization [2-4], despite the frequency of use of the procedure for treating CIN2 or 3. The impact of conization on female sexual function remains controversial. The procedure appears to have a negative effect on sexual function, but anxiety may be the underlying cause of the sexual function change [3]. A report using the Female Sexual Function Index (FSFI)[5] for evaluation of sexual function change after conization showed that only desire (sexual interest) became significant worse, whereas other items assessed by the index were unchanged [4]. The authors emphasized that psychological aspects of sexuality cause sexual function change after conization. Indeed, several studies have reported that psychological aspects of the diagnosis and the

treatment of gynecological diseases, including cervical dysplasia, could influence sexual function [6-8]. Otherwise, other studies have suggested that benign gynecologic surgery or conization for cervical dysplasia do not influence sexual dysfunction [4, 9, 10]. The degree of anxiety associated with the diagnosis and treatment of disease is different for each person. An individual with high trait anxiety could have more fear regarding sexual contact after treatment of cervical dysplasia. However, no studies to date have considered sexual function change after conization according to anxiety levels.

The present study assessed the psychological epidemiology of sexual function change after conization for treatment of CIN, by assessing sexual function before and after the procedure using the FSFI, and assessing trait anxiety using the State-Trait Anxiety Index (STAI).

## Materials and Methods

From February 2006 to October 2010, following Institutional Review Board approval, the authors enrolled sexually active women who had undergone conization for CIN at the Department of Obstetrics and Gynecology of Korea University's Guro Hospital. Seventy-seven patients agreed to participate and gave written consent. Exclusion criteria included patients who had been treated with chemotherapy, radiotherapy, or surgery after diagnosis of cervical cancer, ovarian cancer, endometrial cancer, or uterine cancer, and those with a psychotic disorder. The authors also

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excluded pregnant or non-sexually active women. They included in the present study patients who planned to undergo conization for treatment of CIN. Before the procedure, each participant's sexual function was assessed using the FSFI, a validated six-domain questionnaire that has been translated into the Korean language and the Korean version validated. The FSFI collects information about six domains of female sexuality (desire, arousal, lubrication, orgasm, satisfaction, and pain) and provides an overall score. At follow-up, at least six months after surgery, each woman again completed the FSFI questionnaire [5]. Trait anxiety was assessed using the STAI. The STAI is an introspective psychological inventory consisting of 40 self-reported items pertaining to anxiety. The STAI assesses state anxiety (A-State), and trait anxiety (A-Trait). State anxiety consists of fear, nervousness, discomfort, and the arousal of the autonomic nervous system induced temporarily by situations perceived as dangerous. Trait anxiety (A-Trait) is defined as a relatively enduring disposition to feel stress, worry, and discomfort [11]. State anxiety and trait anxiety are assessed via 20 items each, which are rated on a 4-point Likert-type response scale [11]. The authors considered only trait anxiety because most patients were likely to feel temporary fear and nervousness after their diagnosis of cervical dysplasia.

Statistical analysis was performed using SPSS ver. 18.0. The authors compared FSFI scores before and after conization via a Wilcoxon signed-rank test. The before minus after scores between possible groups (anxiety for sex, trait anxiety, doctors, bleeding, infection, and stenosis) were compared using the Mann-Whitney test or Kruskal-Wallis test. A *p* value of < 0.05 (two-tailed) was considered statistically significant.

## Results

Demographic characteristics of the 77 patients who participated in this study are shown in Table 1. The mean age was  $38.9 \pm 9.0$  (range: 22–66) years. The mean BMI was  $22.8 \pm 2.5$  (17.6–31.2)  $\text{kg}/\text{m}^2$ . The majority of patients were married (81.1%). The Pap smear results were atypical squamous cell-undetermined significance (ASCUS: 6.8%), low-grade squamous intraepithelial lesion (LSIL: 28.4%), high-grade squamous intraepithelial lesion (HSIL: 59.4%), or atypical squamous cell-cannot exclude HSIL (ASC-H: 5.4%). The final pathology after conization was confirmed as CIN1 (5.2%), CIN2 (18.2%), CIN3 (40.3%), or carcinoma in situ (32.5%; Table 2). Table 3 shows the changes in specific aspects of sexual function following conization. The changes in most aspects were statistically significant ( $p < 0.05$ ). Only dyspareunia changes were not statistically significant. Table 4 shows the changes in sexual function after conization by group. The patients with anxiety toward sex after conization had changes in all aspects of sexual function as compared with those without anxiety towards sex. The patients who had mild trait anxiety showed sexual function changes in arousal, orgasm, dyspareunia, and satisfaction versus those without trait anxiety. The group who experienced postcoital bleeding after conization reported changes in most aspects of sexual function, except for desire.

Table 1. — Demographic characteristics ( $n=77$ ).

Characteristics	n (%)
Age (years)	
21-30	15 (19.5)
31-40	29 (37.7)
41-50	25 (32.5)
51-60	5 (6.5)
>60	3 (3.9)
Parity	
0	14 (18.2)
1	23 (29.9)
2	30 (39)
3	8 (10.4)
> 4	2 (2.6)
Marital status	
Single	10 (13)
Married	63 (81.8)
separated	4 (5.2)
Menopause	
Yes	10 (13)
no	67 (87)
OC	
Yes	7 (9.1)
no	70 (90.9)
Pap interval (years)	
< 1	33 (42.8)
1-2	9 (11.7)
2-3	3 (3.9)
> 3	7 (9.1)
No record	25 (32.5)
BMI ( $\text{kg}/\text{m}^2$ )	
< 18.5	5 (6.5)
18.5-22.9	37 (48.1)
23.0-24.9	19 (24.7)
> 25	16 (20.8)
Education	
Primary school	5 (6.5)
Junior high school	8 (10.4)
High school	45 (58.4)
Bachelor's degree	19 (24.7)
Smoking	
None	64 (83.1)
Former	7 (9.1)
Current	6 (7.8)
Alcohol	
None	32 (41.6)
Former	13 (16.9)
Current	32 (41.6)
Gynecologic disease	
None	44 (57.1)
Myoma	20 (26)
Ovary cyst	11 (14.3)
Endometrial pathology	2 (2.6)

OC = oral contraceptive; BMI = body mass index.

## Discussion

Conization is an effective procedure for the management of cervical dysplasia, but whether sexual function may change after the procedure remains open to debate. Coniza-

Table 2. — *Clinical characteristics (n = 77).*

Characteristics	n (%)
Doctors	
Senior	9 (11.7)
Junior	49 (63.6)
Fellow	19 (24.7)
Pap smear	
ASCUS	6 (7.8)
LSIL	22 (28.6)
HSIL	43 (55.8)
SCC	1 (1.3)
ASC-H	4 (5.2)
AGC	1 (1.3)
Pathology	
Mild dysplasia	5 (6.5)
Moderate dysplasia	14 (18.2)
Severe dysplasia	31 (40.3)
CIS	25 (32.5)
SCC	1 (1.3)
AIS	1 (1.3)
Margin	
Positive	1 (1.3)
Negative	76 (98.7)

ASCUS = atypical squamous cell-undetermined significance; LSIL = low grade squamous intraepithelial lesion; HSIL = high grade squamous intraepithelial lesion; SCC = squamous cell carcinoma; ASC-H = atypical squamous cell-cannot exclude HSIL; AGC = atypical glandular cell; CIS = carcinoma in situ; AIS = adenocarcinoma in situ.

Table 3. — *Comparison of sexual function (FSFI score) before and after conization.*

Sexual function	Before conization Mean (SD)	After conization Mean (SD)	Wilcoxon (Z)	p value
Desire	5.23 (1.53)	4.86 (1.56)	2.75	0.006
Arousal	12.25 (3.81)	11.27 (4.02)	3.38	0.001
Lubrication	15.3 (4.16)	14.36 (4.67)	3.07	0.002
Orgasm	10.69 (3.02)	9.9 (3.35)	2.96	0.003
Dyspareunia	12.7 (3.26)	12.21 (3.77)	1.57	0.116
Satisfaction	10.34 (2.89)	9.88 (3.03)	2.46	0.014
Total score	66.51 (15.93)	61.87 (18.51)	3.70	<0.001
Frequency (per week)	1.98(2.14)	1.32(1.38)	4.04	<0.001

Calculated by Wilcoxon signed rank test.

tion removes cervical tissue that is innervated with sensory nerve fibers, and it is therefore plausible for the procedure to have a deleterious effect on overall sexual function. The current study showed statistically significant decreases following conization for most aspects of sexual function, such as desire, arousal, lubrication, orgasm, satisfaction, and frequency. However, dyspareunia did not change after conization.

Data on sexual function after conization or LEEP is limited and remains open to interpretation. In a longitudinal study, Inna *et al.* [3] found statistically significant changes in overall satisfaction, vaginal elasticity, and orgasmic satisfaction. They concluded that the LEEP procedure itself

appears to have a minimal, if any, clinically important adverse effect on sexual function. However, the authors did not find the reasons for the changed sexual function. They suggested that their findings indicated the importance of psychological factors in sexual function, because the adverse changes in vaginal elasticity could not be explained by the physiological effect of LEEP, which exclusively destroys cervical tissue. Another study found that only sexual desire significantly decreased following conization [4]. Sexual desire was primarily influenced by the patient's anxiety and emotional state. Patients had increased discomfort during intercourse after diagnosis and treatment of cervical dysplasia, and increased negative feelings toward sexual intercourse [8]. Many women experience depression and anxiety after a diagnosis of abnormal cytology and colposcopy, and may additionally report sleep disturbances, irritability, crying episodes, and anger outbursts [7]. Women with higher anxiety levels have been reported to have significantly increased dyspareunia and negative feelings about sex [10]. Accordingly, the authors designed this study to confirm that anxiety (assessed by the STAI) causes sexual function changes (assessed via the FSFI). In the present study, statistically significant changes after conization were noted in desire, arousal, lubrication, orgasm, dyspareunia, overall satisfaction, and frequency in patients with anxiety for sex when compared with those who without anxiety for sexual intercourse. Of note is the finding that the patients with mild trait anxiety showed sexual function changes in arousal, orgasm, dyspareunia, and satisfaction as compared with those without trait anxiety. Postoperative complications such as bleeding, cervical stenosis, and infection did not influence sexual function changes. The operative skills according to the doctors also did not influence post-operation sexual function. Postcoital bleeding was associated with sexual function change (i.e., in arousal, lubrication, orgasm, dyspareunia, overall satisfaction, and frequency) after conization. This could be explained as a psychological effect associated with fear of intercourse. These findings suggest that it is most important to reduce anxiety about cervical disease and sex. Dyspareunia and negative feelings about sex that occur on diagnosis of CIN and colposcopy can be reduced by providing informative material (e.g., leaflets) before colposcopy [12]. Such material can explain the meaning of an abnormal smear, the colposcopy procedure, and CIN treatment. Wilkinson *et al.* conducted a randomized trial to assess the usefulness of such a leaflet [12]. The mean STAI score was 49.6 for women not given a simple leaflet compared with 39 in those given a leaflet. However, another study suggested that this type of leaflet is not beneficial [13]. The use of counseling has been slightly studied. Richardson *et al.* performed a randomized trial to investigate the value of cognitive behavioral counseling immediately before colposcopy [14]. All women were given an information leaflet at their appointment and questionnaires

Table 4. — Sexual function difference in 'before minus after scores' between possible groups.

	Desire -Diff	Arousal -Diff	Lubrication -Diff	Orgasm -Diff	Dyspareunia -Diff	Satisfaction -Diff	Total score -Diff	Frequency -Diff
Anxiety for sex								
No	0.05	0.08	0.12	0.00	-0.04	0.02	0.06	0.04
Yes	0.70	2.25	2.00	1.00	0.47	0.69	13.00	0.99
<i>p</i>	0.03	0.003	< 0.001	< 0.001	0.004	0.001	< 0.001	< 0.001
Anxiety trait								
Normal	0.12	0.20	0.30	0.13	0.04	0.09	0.43	0.10
Mild	1.00	3.20	3.00	3.00	0.67	1.00	16.00	0.90
<i>p</i>	0.16	0.05	0.1	0.007	0.01	0.003	0.11	0.07
Doctor*								
Senior	0.20	0.20	0.60	0.25	-0.33	-0.11	0.00	0.33
Junior	0.12	0.26	0.29	0.14	0.23	0.19	0.58	0.12
Fellow	0.50	0.83	0.46	0.36	0.25	0.25	0.55	0.07
<i>p</i>	0.66	0.66	0.69	0.66	0.24	0.24	0.55	0.88
Postop bleeding								
No	0.16	0.26	0.36	0.13	0.13	0.15	0.58	0.66
Yes	0.40	0.50	1.00	1.00	-0.43	0.57	-0.33	0.25
<i>p</i>	0.81	0.67	0.99	0.66	0.19	0.53	0.4	0.97
Postop stenosis								
No	0.15	0.23	0.33	0.18	0.10	0.17	0.45	0.06
Yes	1.50	3.00	4.50	1.00	0.00	0.00	10.00	0.50
<i>p</i>	0.26	0.07	0.06	0.06	0.78	0.66	0.12	0.76
Postop infection								
No	0.15	0.26	0.35	0.19	0.10	0.15	0.46	0.06
Yes	4.00	8.00	4.00	5.00	0.00	2.00	23.00	3.00
<i>p</i>	0.05	0.08	0.13	0.06	0.56	0.08	0.12	0.08
Postcoital bleeding								
No	0.10	0.14	0.26	0.08	0.02	0.08	0.29	0.04
Yes	0.80	2.80	1.67	2.33	0.63	0.86	13.50	1.14
<i>p</i>	0.07	0.004	0.02	<0.001	0.006	0.004	0.002	0.001

Calculated by Mann-Whitney test. \*Calculated by Kruskal Wallis test. Results are medians of each groups. Diff= differential score between before and after conization; postop = postoperative. *p* = *p* value.

were given before and after colposcopy, before and after treatment, and three and six months after procedure. The counseling consisted of an opportunity to discuss concerns related to the smear and colposcopy, and training in relaxation and cognitive coping strategies. Women showed reduced anxiety, fewer negative cognitions, less distress regarding the smear result, and less distress regarding the procedure. Anxiety stems from a fear of cancer and fearing of a loss of reproductive ability or sexual function. As such, counseling should include information about cancer risk, reproductive ability, and sexual function. Spontaneous interest in sex was reduced in women who were not sent an information leaflet [13]. This indicates that sexual dysfunction occurs due to anxiety about the diagnosis and treatment of cervical dysplasia. Most patients will receive information about the disease from their doctor. Therefore, communication between patient and doctor is important to understand the treatment and disease progression [15]. However, a doctor's explanation is not always understood by the patients. Kavanagh *et al.* emphasized that a video on the procedure and precolposcopy sessions where the patient is taken through the procedure is helpful for patients to gain an understanding of cervical dysplasia [15].

## Conclusions

The present authors found that conization led to decreases in most aspects of sexual function, such as desire, arousal, lubrication, orgasm, satisfaction, and frequency, although no changes were observed for dyspareunia. However, changes were more pronounced in patients with anxiety toward sex or trait anxiety compared with patients without anxiety. Therefore, psychological counseling should be emphasized before conization or colposcopy for cervical dysplasia.

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