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Impact of Treatment Modality on Pain, Sexual Function, and Psychological Well-Being in Patients With Bartholin's Duct Cyst and Abscess: A Prospective Observational Cohort Study

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Study Design A
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Background: Bartholin's duct cyst and abscess are common benign vulvar conditions. Optimal treatment varies according to recurrence, pain, and patient-centered outcomes. Comparative evidence regarding Word catheter placement, silver nitrate, and marsupialization is limited.

Material/Methods: This prospective observational cohort study included 111 women diagnosed with Bartholin's duct cyst or abscess between December 2020 and May 2021. Patients underwent treatment according to clinical practice, physician preference, and patient choice. Pain intensity (primary outcome), sexual function, and psychological status were evaluated using the Visual Analog Scale (VAS), Female Sexual Function Index (FSFI), and Hospital Anxiety and Depression Scale (HADS), respectively. Recurrence and postoperative analgesic requirements were also evaluated. Assessments were performed before treatment and on postoperative day 1, week 1, and month 1.

Results: All treatment modalities were associated with significant reductions in pain intensity according to the VAS (all $P < 0.001$). In the Word catheter group, significant changes were observed in VAS ($P < 0.001$), HADS-anxiety ($P < 0.001$), and FSFI ($P = 0.044$) scores. In the silver nitrate group, significant improvements were observed in VAS ($P < 0.001$) and HADS-anxiety ($P = 0.026$) scores; FSFI score alterations were not statistically significant ($P = 0.209$). In the marsupialization group, significant improvement was observed in VAS scores ($P < 0.001$); FSFI ($P = 0.412$) and HADS-anxiety ($P = 0.236$) score alterations were not statistically significant.

Conclusions: Word catheter placement, silver nitrate, and marsupialization had distinct effects on pain relief and psychological outcomes; sexual function outcomes were comparable. Treatment selection should consider patient-centered outcomes and clinical resolution.

Keywords: Anxiety • Bartholin's Cyst • Gynecology • Pain Measurement • Prospective Studies • Sexual Dysfunction, Physiological

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2722 5 — 14

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Introduction

Bartholin's duct cysts and gland abscesses are among the most common benign vulvar conditions, affecting approximately 2% to 3% of women during their lifetime and occurring predominantly during the reproductive years [1,2]. Obstruction of the Bartholin duct leads to cyst formation, whereas superinfection of the cyst results in abscess development, representing different stages of the same pathological process. Patients typically present with vulvar swelling, acute pain, dyspareunia, and limitations in daily activities, particularly in cases of abscess [2]. Although these conditions are benign, their effects on physical comfort, sexual function, and psychological well-being can be substantial.

Several treatment modalities are currently used in clinical practice, including Word catheter placement, marsupialization, and chemical ablation techniques such as silver nitrate application [3-5]. Simple incision and drainage alone are generally discouraged due to high recurrence rates; procedures that create a permanent drainage tract are preferred [3]. Despite the widespread use of these interventions, the optimal first-line approach remains controversial. Comparative studies and randomized trials have shown similar recurrence rates for Word catheter placement and marsupialization, although differences in postoperative pain, recovery time, and patient satisfaction have been observed [6-8]. A recent systematic review and meta-analysis further demonstrated no significant difference in recurrence between Word catheter placement and marsupialization, indicating that clinical resolution alone may not adequately capture treatment success [9].

In addition to recurrence, increasing attention has been directed toward patient-centered outcomes, including pain relief, sexual function, and psychological status. Previous studies have shown that surgical management of Bartholin's gland pathology can influence sexual function and quality of life [10,11]. Moreover, chronic vulvar pain and genital disorders are closely associated with anxiety and depressive symptoms, emphasizing the need for multidimensional outcome assessment [12,13]. Validated instruments such as the Visual Analog Scale (VAS), Female Sexual Function Index (FSFI), and Hospital Anxiety and Depression Scale (HADS) have been widely used to quantify pain intensity, sexual function, and psychological well-being in gynecologic research [12-14].

Although Word catheter placement and marsupialization have been relatively well studied, data on silver nitrate—particularly in comparison with these modalities and regarding patient-reported outcomes—remain limited. Most available reports primarily focus on recurrence and procedural success; relatively few studies have simultaneously evaluated pain, sexual function, and psychological status. This represents an important knowledge gap because recovery from Bartholin's cyst or abscess extends beyond anatomical resolution to include pain relief, restoration of sexual function, and psychological well-being.

Therefore, the aim of this prospective observational comparative cohort study was to evaluate and compare the effects of Word catheter placement, silver nitrate, and marsupialization on pain intensity (primary outcome), female sexual function, and psychological well-being in women treated for Bartholin's cyst or abscess using VAS, FSFI, and HADS scores.

Material and Methods

Study Design and Participants

This investigation was designed as a prospective observational comparative cohort study. Women aged 18 years and older who were diagnosed with Bartholin's cyst or abscess and treated at the Department of Obstetrics and Gynecology, Gazi Yaşargil Training and Research Hospital, between December 2020 and May 2021 were consecutively enrolled.

Inclusion criteria were age at least 18 years, a clinical diagnosis of Bartholin's cyst or abscess, and provision of written informed consent. Exclusion criteria were chronic systemic disease, active smoking or alcohol use, pregnancy, and refusal to participate. This study did not include a control group, and no randomization or blinding was performed.

Clinical Definition

Bartholin's cyst and abscess were considered different stages of the same pathological process, with abscess representing an infected form of a pre-existing cyst. Therefore, patients were analyzed as a single cohort.

Patient Allocation and Treatment Modalities

Patients were allocated to treatment groups according to routine clinical practice based on clinical presentation, physician preference, and patient choice. The 3 treatment modalities evaluated were Word catheter placement, silver nitrate application, and marsupialization.

Word catheter placement was performed under local anesthesia after drainage of the cyst or abscess cavity. A balloon catheter was inserted to maintain tract patency and promote re-epithelialization; the incision site was secured with absorbable sutures (3/0 Vicryl Rapid).

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Silver nitrate treatment consisted of inserting an approximately 0.5-cm silver nitrate stick into the cavity under local anesthesia to achieve chemical cauterization and cavity obliteration. Suturing was not routinely required.

Marsupialization was performed under local or spinal anesthesia. A portion of the cyst wall was everted and sutured to the vaginal mucosa using absorbable sutures (2/0 or 3/0 Vicryl) to establish continuous drainage.

Demographic and clinical variables, including age, body mass index, obstetric history, previous treatments, cyst or abscess size and location, recurrence status, and postoperative analgesic requirements, were recorded.

Infection Assessment and Management

Patients were clinically evaluated for signs of abscess formation, including localized swelling, pain, erythema, and fluctuance. Systemic signs of infection, including fever, were assessed before intervention. Drainage was performed in all cases of abscess. Culture specimens were obtained at the discretion of the treating physician, particularly in patients with recurrent or severe infection. Antibiotic therapy was prescribed for patients with systemic signs of infection, surrounding cellulitis, or other clinical indications based on physician judgment. Routine antibiotic therapy was not administered to all patients.

Outcome Measures and Follow-Up

The primary outcome of the study was the change in pain intensity, as measured by the VAS, at 1 month. Secondary outcomes included FSFI scores, HADS scores, recurrence rate, and postoperative analgesic requirements.

Pain intensity was assessed using the VAS (range, 0-10), where 0 indicates no pain and 10 indicates the worst imaginable pain. Validated Turkish versions of the FSFI and HADS were used. FSFI total scores range from 2 to 36, with higher scores indicating better sexual function. The HADS consists of anxiety and depression subscales (0-21 each), with higher scores indicating greater symptom severity.

VAS scores were recorded before treatment and on postoperative day 1, week 1, and month 1. FSFI and HADS scores were assessed before treatment and at the 1-month follow-up. All questionnaires were administered in person by trained clinical staff. No blinding was applied.

Safety Monitoring

All patients were screened for systemic infection prior to intervention. Patients with suspected systemic involvement were treated in accordance with standard clinical protocols. Postprocedural complications were monitored during follow-up visits.

Ethics Approval

The study was approved by the Ethics Committee of Gazi Yaşargil Training and Research Hospital (Decision No. 719; March 26, 2021). Written informed consent was obtained from all participants before enrollment. The study was conducted in accordance with the Declaration of Helsinki.

Statistical Analysis

Statistical analyses were performed using SPSS version 25.0 (IBM Corp., Chicago, IL, USA). Data distribution normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Continuous variables were expressed as mean ± standard deviation or median (interquartile range), as appropriate. Categorical variables were presented as frequencies and percentages.

Between-group comparisons were performed using the Kruskal-Wallis test for non-normally distributed variables and the chi-square test for categorical variables. Pre- and post-treatment comparisons were conducted using the Wilcoxon signed-rank test. Correlations were evaluated using the Spearman correlation coefficient. *P*-values < 0.05 were considered statistically significant.

Post hoc power analysis was performed based on the primary outcome (VAS score at 1 month), assuming a medium effect size and $\alpha = 0.05$, demonstrating that the study achieved greater than 80% statistical power. However, the study was not specifically powered for secondary outcomes, which should be interpreted with caution. No imputation was performed for missing data because complete outcome data were available for all included participants.

Results

In total, 111 women were included in the study: 37 in the Word catheter group, 43 in the silver nitrate group, and 31 in the marsupialization group.

Baseline Characteristics

Baseline demographic and clinical characteristics were comparable among groups. Mean age and body mass index did not significantly differ among groups (all $P > 0.05$). There were also no significant differences in marital status, obstetric history, previous treatments, cyst or abscess location, lesion size, or

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postoperative analgesic requirements (all $P > 0.05$) (**Tables 1, 2**). Pretreatment VAS, FSFI, and HADS scores were similar across groups, indicating baseline homogeneity.

Between-Group Comparisons at Follow-Up

No significant differences were observed among groups in VAS scores measured on postoperative day 1, week 1, or month 1, nor were differences present in FSFI scores at postoperative month 1 (all $P > 0.05$). However, significant between-group differences were detected in HADS-depression ($P = 0.021$) and HADS-anxiety ($P = 0.037$) scores at month 1 (**Table 3**).

Within-Group Changes

All treatment modalities were associated with significant reductions in pain intensity according to the VAS (all $P < 0.001$). In the Word catheter group, significant changes were observed in VAS ($P < 0.001$), HADS-anxiety ($P < 0.001$), and FSFI ($P = 0.044$) scores. In the silver nitrate group, significant improvements were observed in VAS ($P < 0.001$) and HADS-anxiety ($P = 0.026$) scores; FSFI score alterations were not statistically significant ($P = 0.209$). In the marsupialization group, significant improvement was observed in VAS scores ($P < 0.001$); FSFI ($P = 0.412$) and HADS-anxiety ($P = 0.236$) score alterations were not statistically significant.

Overall Cohort

In the overall cohort, recurrence rate, VAS score (primary outcome), and HADS-anxiety score significantly differed between pretreatment and post-treatment assessments (all $P < 0.001$) (**Table 4**).

Analgesic Outcome

Postoperative analgesic requirements did not significantly differ among treatment groups ($P > 0.05$) (**Table 2**).

Recurrence

Post-treatment recurrence was defined as the reappearance of symptoms requiring clinical intervention during follow-up. Overall, recurrence significantly decreased after treatment (62 [55.8%] before treatment vs 7 [6.3%] after treatment, $P < 0.001$). Post-treatment recurrence occurred in 1 patient (2.7%) in the Word catheter group, 3 patients (6.9%) in the silver nitrate group, and 3 patients (9.6%) in the marsupialization group; no significant difference was detected among treatment groups ($P = 0.489$) (**Tables 2, 4**).

Correlation Analysis

At 1 month, VAS scores were negatively correlated with FSFI scores ($r = -0.28$, $P = 0.003$), indicating that lower pain levels were associated with better sexual function. VAS scores were positively correlated with HADS-depression scores ($r = 0.30$, $P = 0.001$), suggesting that greater pain intensity was associated with more severe depressive symptoms.

FSFI scores were negatively correlated with HADS-depression scores ($r = -0.32$, $P = 0.001$). Additionally, positive correlations were observed between pretreatment and post-treatment FSFI scores ($r = 0.49$, $P < 0.001$) and HADS-depression scores ($r = 0.29$, $P = 0.002$), indicating persistence of baseline functional and psychological status after treatment (**Table 5**).

Discussion

This prospective observational comparative cohort study evaluated 3 commonly used treatment modalities—Word catheter placement, silver nitrate, and marsupialization—for Bartholin's cyst or abscess, with a particular focus on patient-centered outcomes. The primary outcome was pain reduction, as measured by the VAS; secondary outcomes included sexual function

Table 1. Patient demographic characteristics.

Characteristic		Word catheter group (n = 37)	Silver nitrate group (n = 43)	Marsupialization group (n = 31)	*P*
Age (years)		30.0 (14.0)	32.0 (15.0)	29.0 (11.0)	0.804
Body mass index (kg/m²)		24.0 (6.02)	22.8 (5.71)	24.6 (5.51)	0.205
Marital status	Married	33.0 (89.2%)	32.0 (74.4%)	27.0 (87.1%)	0.168
	Single	4.0 (10.8%)	11.0 (25.6%)	4.0 (12.9%)	
Pregnancy	Yes	4.0 (10.8%)	6.0 (14.0%)	5.0 (16.1%)	0.812
	No	33.0 (89.2%)	37.0 (86.0%)	26.0 (83.9%)	

Data are presented as median (interquartile range) or n (%), as appropriate. Comparisons were performed using the Kruskal-Wallis test. *P*-values < 0.05 were considered statistically significant.

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Table 2. Clinical characteristics according to treatment modality.

Variable	Word catheter group (n = 37)	Silver nitrate group (n = 43)	Marsupialization group (n = 31)	*P*
Previous treatment				0.237
None	13 (35.1)	25 (58.1)	12 (38.7)	
Word catheter placement	1 (2.7)	3 (7.0)	0 (0.0)	
Silver nitrate	16 (43.2)	6 (14.0)	12 (38.7)	
Marsupialization	3 (8.1)	2 (4.7)	5 (16.1)	
Incision and drainage	4 (10.8)	7 (16.3)	2 (6.5)	
Number of recurrences before treatment				0.177
< 5	36 (97.3)	37 (86.0)	29 (93.5)	
5-10	1 (2.7)	5 (11.6)	1 (3.2)	
> 10	0 (0.0)	1 (2.3)	1 (3.2)	
Pretreatment recurrence				0.140
Yes	24 (64.9)	19 (44.2)	19 (61.3)	
No	13 (35.1)	24 (55.8)	12 (38.7)	
Post-treatment recurrence				0.489
Yes	1 (2.7)	3 (6.9)	3 (9.6)	
No	36 (97.3)	40 (93.1)	28 (90.4)	
Postoperative analgesic requirement				0.261
Yes	4 (10.8)	3 (7.0)	6 (19.4)	
No	33 (89.2)	40 (93.0)	25 (80.6)	
Lesion location				0.312
Right	20 (54.1)	17 (39.5)	17 (54.8)	
Left	17 (45.9)	25 (58.1)	13 (41.9)	
Bilateral	0 (0.0)	1 (2.3)	1 (3.2)	
Lesion size (cm)	5.0 (2.0)	4.5 (1.0)	4.5 (1.0)	0.408
Lesion size category				0.266
< 5 cm	13 (35.1)	21 (48.8)	15 (48.4)	
5-10 cm	22 (59.5)	20 (46.5)	15 (48.4)	
> 10 cm	2 (5.4)	2 (4.7)	1 (3.2)	

Data are presented as median (interquartile range) or n (%), as appropriate. Comparisons were performed using the Kruskal-Wallis test or chi-square test, as appropriate. *P*-values < 0.05 were considered statistically significant.

(FSFI) and psychological well-being (HADS). Although all 3 approaches were associated with significant pain reduction, distinct profiles were observed for sexual function and anxiety-depression scores, emphasizing that treatment success extends beyond clinical resolution alone.

In the present study, Bartholin's cyst and abscess were evaluated as part of a continuous clinical spectrum, rather than as separate entities. Abscess formation was considered an infected stage of a pre-existing cyst, reflecting routine clinical practice. However, we acknowledge that cysts and abscesses can

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Table 3. Comparison of VAS, FSFI, and HADS scores among treatment groups.

	Word catheter group (n = 37)	Silver nitrate group (n = 43)	Marsupialization group (n = 31)	*P*
VAS pretreatment	7.0 (7.0)	7.0 (8.0)	5.0 (4.0)	0.718
VAS postoperative day 1	5.0 (6.0)	3.0 (5.0)	3.0 (5.0)	0.264
VAS postoperative week 1	2.0 (4.0)	2.0 (2.0)	1.0 (2.0)	0.113
VAS postoperative month 1	1.0 (2.0)	1.0 (1.0)	1.0 (3.0)	0.532
FSFI pretreatment	22.4 (9.9)	19.8 (16.7)	20.9 (19.4)	0.300
FSFI postoperative month 1	21.3 (17.9)	23.2 (11.8)	23.2 (17.5)	0.735
HADS-depression pretreatment	7.0 (6.0)	7.5 (7.0)	9.5 (7.0)	0.189
HADS-depression postoperative month 1	6.0 (7.0)	5.0 (8.0)	9.0 (8.0)	**0.021**
HADS-anxiety pretreatment	9.0 (5.0)	10.0 (8.0)	9.5 (5.0)	0.574
HADS-anxiety postoperative month 1	5.0 (8.0)	5.0 (8.0)	9.0 (5.0)	**0.037**

Abbreviations: FSFI, Female Sexual Function Index; HADS, Hospital Anxiety and Depression Scale; VAS, Visual Analog Scale. Data are presented as median (interquartile range). Comparisons were performed using the Kruskal-Wallis test. *P*-values < 0.05 were considered statistically significant.

Table 4. Comparison of pre- and post-treatment VAS, FSFI, and HADS scores among treatment groups.

Outcome	Group	Pretreatment	Post-treatment (1 month)	P
Recurrence	All patients	62 (55.8%)	7 (6.3%)	**< 0.001**
VAS score	(Word catheter group; n = 37)	7.0 (7.0)	1.0 (2.0)	**< 0.001**
	(Silver nitrate group; n = 43)	7.0 (8.0)	1.0 (1.0)	**< 0.001**
	(Marsupialization group; n = 31)	5.0 (4.0)	1.0 (3.0)	**< 0.001**
	All patients	7.0 (6.0)	1.0 (2.0)	**< 0.001**
FSFI score	(Word catheter group; n = 37)	22.4 (9.9)	21.3 (17.9)	**0.044**
	(Silver nitrate group; n = 43)	19.8 (16.7)	23.2 (11.8)	0.209
	(Marsupialization group; n = 31)	20.9 (12.9)	23.2 (17.5)	0.412
	All patients	21.3 (12.9)	22.8 (16.0)	0.915
HADS-depression score	(Word catheter group; n = 37)	7.0 (6.0)	6.0 (7.0)	0.560
	(Silver nitrate group; n = 43)	7.5 (7.0)	5.0 (8.0)	0.058
	(Marsupialization group; n = 31)	9.5 (7.0)	9.0 (8.0)	0.645
	All patients	8.0 (7.0)	7.0 (8.0)	0.068
HADS-anxiety score	(Word catheter group; n = 37)	9.0 (5.0)	5.0 (8.0)	**< 0.001**
	(Silver nitrate group; n = 43)	10.0 (8.0)	5.0 (8.0)	**0.026**
	(Marsupialization group; n = 31)	9.5 (5.0)	9.0 (5.0)	0.236
	All patients	9.0 (6.0)	7.0 (8.0)	**< 0.001**

Abbreviations: FSFI, Female Sexual Function Index; HADS, Hospital Anxiety and Depression Scale; VAS, Visual Analog Scale. Data are presented as median (interquartile range) or n (%), as appropriate. Comparisons were performed using the Wilcoxon signed-rank test. *P*-values < 0.05 were considered statistically significant.

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Table 5. Correlation analysis of outcome measures.

	N	r	P
VAS (1 month) ↔ FSFI (1 month)	111	-0.28	**0.003**
VAS (1 month) ↔ HADS-depression (1 month)	111	+0.30	**0.001**
FSFI (1 month) ↔ HADS-depression (1 month)	111	-0.32	**0.001**
FSFI (pretreatment) ↔ FSFI (post-treatment)	111	+0.49	**< 0.001**
HADS-depression (pretreatment) ↔ HADS-depression (post-treatment)	111	+0.29	**0.002**

Spearman correlation analysis was conducted. Abbreviation: r, correlation coefficient.

differ in symptom severity and infection status, which represents a limitation of the study.

Previous studies and randomized trials have demonstrated broadly comparable recurrence rates between Word catheter placement and marsupialization, supporting both as acceptable first-line treatment options [6-9]. However, recurrence alone does not adequately reflect the patient experience. Increasing evidence highlights the importance of postoperative comfort, recovery time, and functional outcomes. Our findings are consistent with earlier reports showing that surgical management of Bartholin's gland pathology can influence sexual function and quality of life [10,11]. In particular, the randomized study by Aydogan Mathyk et al demonstrated that surgical treatment of Bartholin's abscess may lead to measurable changes in sexual function.

Unlike that trial, our study also evaluated psychological outcomes, providing a broader patient-centered perspective. Moreover, real-world studies have suggested that Word catheter placement is generally feasible and cost-effective, although temporary discomfort and limitations in sexual activity can occur during the treatment period [7]. Although improvements in FSFI scores were observed within certain groups, we did not detect significant differences among treatment modalities, suggesting that sexual function outcomes are comparable across techniques.

All patients were clinically evaluated for infection prior to intervention; appropriate drainage and antibiotic therapy were provided when indicated. This approach was designed to ensure that standard clinical management principles were followed, although detailed microbiological data were not systematically collected.

An important contribution of the present study is its simultaneous evaluation of pain, sexual function, and psychological status using validated instruments. The observed negative correlation between pain intensity and FSFI scores indicates that effective pain control is closely associated with improvements in sexual function. Similarly, the positive association between pain and depressive symptoms, combined with the negative correlation between FSFI and HADS-depression scores, underscores the interdependence of physical symptoms and psychological well-being. These findings are consistent with previous studies demonstrating that chronic vulvar pain and genital disorders are strongly associated with anxiety and depression; improvements in sexual function may parallel psychological recovery [12-14].

Although Word catheter placement and marsupialization have been relatively well studied, data regarding silver nitrate remain limited. Earlier randomized work suggested comparable symptom resolution with marsupialization and silver nitrate [5], but most studies have primarily focused on recurrence and procedural success. In our cohort, silver nitrate was associated with meaningful reductions in pain and anxiety scores, suggesting that it represents a reasonable alternative for selected patients. The present findings add to existing literature by providing prospective data on patient-reported outcomes while using silver nitrate along with more established techniques.

The present findings also emphasize that treatment modalities can yield similar clinical improvement while differing in their effects on functional and psychological outcomes. This conclusion supports a patient-centered approach in which treatment decisions are individualized according to clinical presentation, patient preferences, and functional priorities rather than recurrence risk alone. Such an approach may enhance shared decision-making and optimize overall patient satisfaction.

Several limitations should be acknowledged. First, the single-center design and moderate sample size may limit the generalizability of the findings. Second, the non-randomized treatment allocation was based on routine clinical practice, physician preference, and patient choice, introducing the potential for selection bias and unmeasured confounding. Third, follow-up was limited to 1 month, precluding assessment of long-term recurrence and sustained effects on sexual function and psychological well-being. Fourth, Bartholin's cyst and abscess were

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analyzed as a single cohort, which may have obscured potential differences in infection severity. Finally, outcomes were assessed via self-reported questionnaires, which may be subject to response bias. Additionally, the study was not specifically powered for secondary outcomes, which should be interpreted with caution. Despite these limitations, the prospective design and multidimensional outcome assessment strengthen the validity of our findings.

Overall, this study contributes to the growing body of evidence suggesting that the management of Bartholin's cyst and abscess should incorporate patient-reported outcomes with conventional clinical endpoints. Future multicenter studies involving larger cohorts, longer follow-up, and stratified analyses of cyst and abscess cases are warranted to further clarify long-term outcomes and refine evidence-based, patient-centered treatment algorithms.

Conclusions

Word catheter placement, silver nitrate, and marsupialization were all effective in reducing pain (primary outcome) among women treated for Bartholin's cyst or abscess. However, each modality demonstrated a distinct profile with respect to psychological outcomes, whereas sexual function outcomes were broadly comparable among groups. In addition to clinical resolution, our findings highlight robust interrelationships among pain intensity, female sexual function, and depressive symptoms, emphasizing that recovery encompasses both physical and psychosocial dimensions.

The observed correlations among VAS, FSFI, and HADS scores indicate that improvements in pain are closely associated with enhanced sexual function and psychological well-being. These findings support a patient-centered approach to treatment selection, in which therapeutic decisions are guided by recurrence prevention along with functional priorities and patient preferences, considering both physical and psychosocial outcomes.

Although limited by its single-center design, short follow-up period, and insufficient power for secondary outcomes, this prospective observational study provides multidimensional outcome data comparing 3 commonly used treatment modalities, including silver nitrate. Future multicenter studies with larger cohorts, longer follow-up, and stratified analyses of cyst and abscess presentations are warranted to clarify long-term recurrence patterns and sustained functional outcomes, while informing evidence-based, individualized management strategies for Bartholin's gland pathology.

Data Availability Statement

The datasets generated and/or analyzed during this study are available from the corresponding author on reasonable request.

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