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Original Research

Comparison of Enzian and rASRM classifications in predicting symptoms of sexual dysfunction in endometriosis

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Abstract

Background: Endometriosis is known to negatively impact sexual function; however, limited research has explored whether classification systems can help pinpoint specific anatomical locations associated with sexual dysfunction. This study was necessitated by the paucity of literature on classification systems that allow clinicians to associate specific symptoms of sexual dysfunction with particular locations of deep infiltrating endometriosis (DIE).
Aim: This study aimed to investigate whether the Enzian and revised American Society for Reproductive Medicine (rASRM) classification systems can predict sexual dysfunction based on the localization and extent of DIE.
Methods: A clinical study was conducted with 77 women with histologically confirmed DIE. Data were collected from gynecological consultations and surgical reports classified using the rASRM and Enzian systems. Sexual function was assessed using the Female Sexual Function Index. Statistical analyses included Fisher's exact test, Mann–Whitney test, and Student's t-test.
Outcomes: The primary outcome was to examine the relationship between endometriosis localization, disease extent, and sexual dysfunction as indicated by the two classification systems under investigation.
Results: A possible association was identified between sexual dysfunction and Enzian B classification ($p = 0.013$*), implicating involvement of the sacrouterine ligaments, cardinal ligaments, or pelvic sidewall. No significant association was found between sexual dysfunction and rASRM scores. A correlation between the number of endometriosis locations and the presence of sexual dysfunction was also observed ($p = 0.015$*). However, it is important to note that patients classified as Enzian B may have had additional, undocumented lesions in other locations not identified through available medical records, imaging, or surgical reports. These unidentified lesions could have influenced their sexual dysfunction, representing a potential confounding factor in our analysis.
Clinical Implications: These findings suggest that the localization of DIE may contribute to sexual dysfunction, but further validation is required before drawing clinical conclusions regarding surgical interventions.
Strengths & Limitations: This is the first study to explore the ability of a classification system to pinpoint sexual dysfunction in endometriosis to a particular anatomical location, providing novel insights into DIE's impact on sexual health. However, variability in referral sources, the potential for undocumented lesions, and a small sample size for cases of sexual dysfunction may limit the generalizability of these findings.
Conclusion: Disease localization, particularly in the uterosacral ligaments and pelvic sidewall, may contribute to sexual dysfunction, offering potential guidance for clinical evaluation. However, further research is necessary to validate these associations while accounting for potential confounding factors.

Keywords: endometriosis; sexuality; Enzian; rASRM.

Introduction

Endometriosis is a chronic, benign, estrogen-dependent inflammatory disease defined by the presence of endometrial gland and stroma-like tissue outside the uterine cavity.[1,2] Traditionally regarded as one of the most common gynecologic diseases, recent studies increasingly classify it as a systemic disorder affecting not only the reproductive organs but also mood, metabolism, autoimmune conditions, cancer risk, and the cardiovascular system.[3-5] Estimates suggest it affects approximately 10% of women of reproductive age and 30%–50% of women with infertility and/or pelvic pain.[6]

Endometriosis significantly impacts various aspects of women's lives, including social relationships, work, and education.[7] It is associated with a higher incidence of depression and anxiety.[8,9] Quality of life is often diminished due to pain, the emotional impact of subfertility, the potential recurrence of the disease, uncertainty about the future, repeated surgeries, and prolonged medical therapies.[2] Furthermore, the disease's effects on partners and the couple as a unit are pronounced, given the absence of an obvious cause or cure, the likelihood of chronic, recurring symptoms, and the potential impact on both sexual function and fertility.[10]

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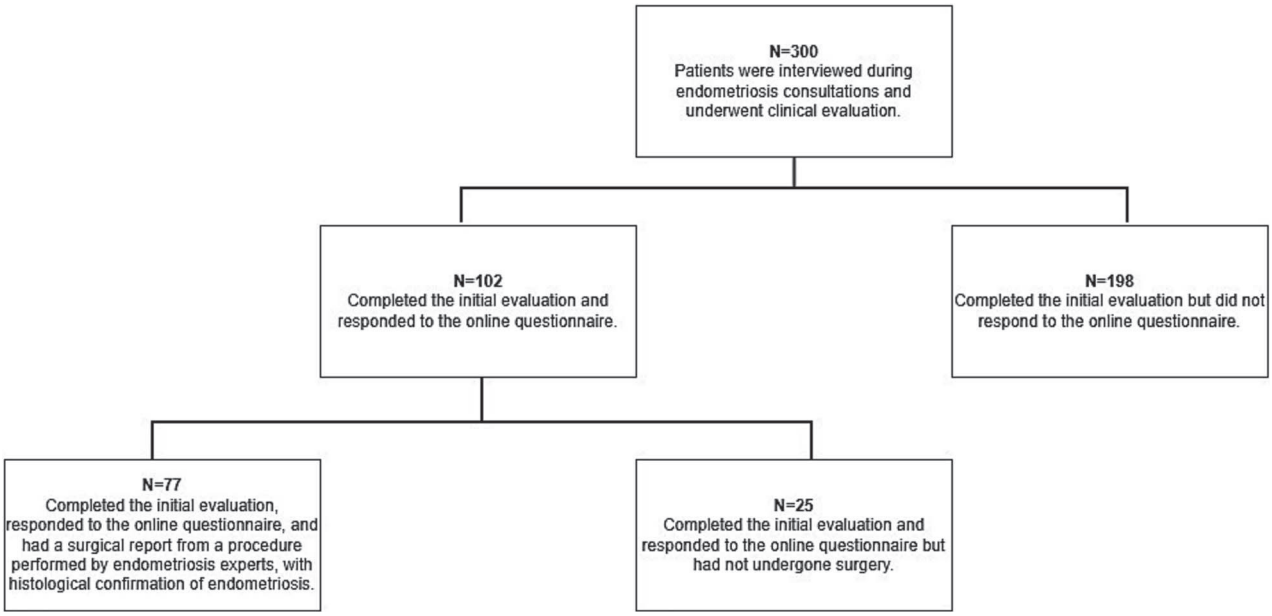


Figure 1. Flow diagram of the clinical study.

Several studies have explored the negative impact of endometriosis on sexual function.[11-13] Ferrero et al. reported that among subjects with deep dyspareunia, those with deep infiltrating endometriosis (DIE) of the uterosacral ligaments experienced the most severe sexual dysfunction.[11] In a comparison of women with rectovaginal endometriosis, peritoneal/ovarian endometriosis, and healthy controls, Vercellini et al. found more frequent and severe dyspareunia in women with endometriosis, although no significant differences were observed between rectovaginal and peritoneal/ovarian endometriosis.[14] Mabrouk et al. also observed that women with DIE experienced deep dyspareunia more frequently than those with isolated ovarian endometriosis.[15] However, an association between the exact localization of deep endometriosis and overall sexual function has not been established.

The American Fertility Society introduced a classification scheme in 1979, later revised and renamed as the revised American Society for Reproductive Medicine (rASRM) classification.[16] This classification evaluates disease extent and reproductive organ function, focusing on lesion size in the ovaries and peritoneum, fallopian tube blockage, and adhesion severity (Figure 2). While widely used due to its simplicity and utility in explaining disease severity to patients, the rASRM classification does not detail the extent of DIE. Deep dyspareunia has multifactorial causes, including central sensitization, but may directly result from endometriosis-specific factors such as DIE.[17] Vercellini et al.[18] observed that endometriosis stage was not consistently related to pain symptoms. However, the presence of vaginal lesions was frequently associated with severe deep dyspareunia. The rASRM classification also omits detailed descriptions of DIE in locations such as the uterosacral ligaments, bladder, vagina, and bowel. A more detailed characterization of DIE could better correlate with dyspareunia and sexual function.

The Enzian classification, first published in 2003 and revised in 2011,[19] is recognized as a valid and useful tool for classifying DIE based on imaging and surgical findings. The #Enzian classification (Figure 2) is based on the known Enzian classification for DE using three compartments: A (vagina, rectovaginal space), B (uterosacral ligaments, cardinal ligaments, pelvic sidewall), and C (rectum), with additional consideration of extragenital lesions (eg, urinary bladder, ureters) and peritoneal and ovarian involvement (Figures 3, 4, and 5).[19]

This study was necessitated by the paucity of literature examining how classification systems enable clinicians to pinpoint specific sexual dysfunctions to particular locations of endometriotic pathology.

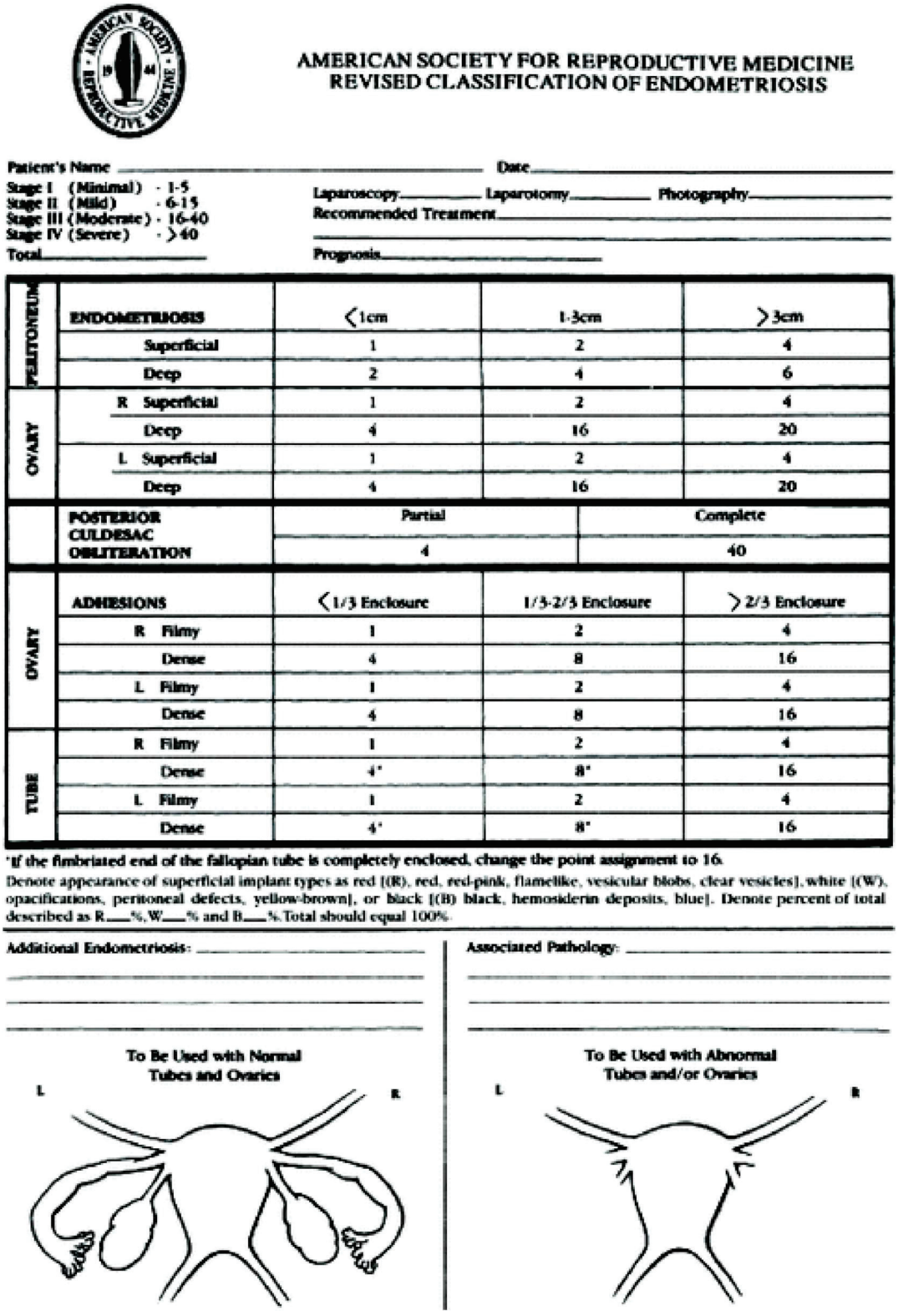
The aims of this study are to evaluate sexual function in women with endometriosis; investigate relationships between sexual function and disease localization using the rASRM and Enzian classifications; and assess the influence of symptoms and lesion localization on sexual function. To date, few studies have evaluated DIE across three compartments or correlated specific endometriosis localizations with sexual function.

Material and methods

Participants

Eligible participants were women of reproductive age (over 18 years old), not pregnant, who were being followed in endometriosis consultations, and who voluntarily consented to participate in the project by signing the Informed Consent Form. Exclusion criteria included being under 18 years old or postmenopausal, currently pregnant, having a diagnosis of another physical disease with significant implications for quality of life, or having a diagnosis of mental illness with significant implications for quality of life. Of the 300 patients initially evaluated during the consultation and meeting the inclusion criteria, 102 completed the evaluation and answered the online questionnaire (Figure 1). Among these, 77 also completed the initial evaluation, responded to the online questionnaire, and had both a surgical report from endometriosis experts and a histologic diagnosis of endometriosis.

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AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
REVISED CLASSIFICATION OF ENDOMETRIOSIS

Patient's Name _____ Date _____

Stage I (Minimal) - 1-5
Stage II (Mild) - 6-15
Stage III (Moderate) - 16-40
Stage IV (Severe) - >40
Total _____

Laparoscopy _____ Laparotomy _____ Photography _____
Recommended Treatment _____
Prognosis _____

	ENDOMETRIOSIS	<1cm	1-3cm	>3cm
PERITONEUM	Superficial	1	2	4
	Deep	2	4	6
OVARY	R Superficial	1	2	4
	Deep	4	16	20
	L Superficial	1	2	4
	Deep	4	16	20

		Partial	Complete
	POSTERIOR CULDESAC OBLITERATION	4	40

	ADHESIONS	<1/3 Enclosure	1/3-2/3 Enclosure	>2/3 Enclosure
OVARY	R Filmy	1	2	4
	Dense	4	8	16
	L Filmy	1	2	4
	Dense	4	8	16
TUBE	R Filmy	1	2	4
	Dense	4*	8*	16
	L Filmy	1	2	4
	Dense	4*	8*	16

*If the fimbriated end of the fallopian tube is completely enclosed, change the point assignment to 16.

Denote appearance of superficial implant types as red [(R), red, red-pink, flamelike, vesicular blobs, clear vesicles], white [(W), opacifications, peritoneal defects, yellow-brown], or black [(B) black, hemosiderin deposits, blue]. Denote percent of total described as R.___%, W.___% and B.___%. Total should equal 100%.

Additional Endometriosis: _____

Associated Pathology: _____

To Be Used with Normal Tubes and Ovaries

To Be Used with Abnormal Tubes and/or Ovaries

Figure 2. Revised ASRM classification: 1996.

Procedures

The study was approved by the ethical committee of the Faculty of Psychology and Education Science and the ethical committee of the Centro Hospitalar Universitário de Santo António the tertiary hospital where the study was conducted. Patients were informed about the study at the beginning of their first consultation with the endometriosis expert. Those who agreed to participate were interviewed and sent the online questionnaire. All patients underwent examination during consultation as part of the standard evaluation protocol for endometriosis. Additionally, a retrospective analysis of surgical reports was conducted for the 77 women who underwent

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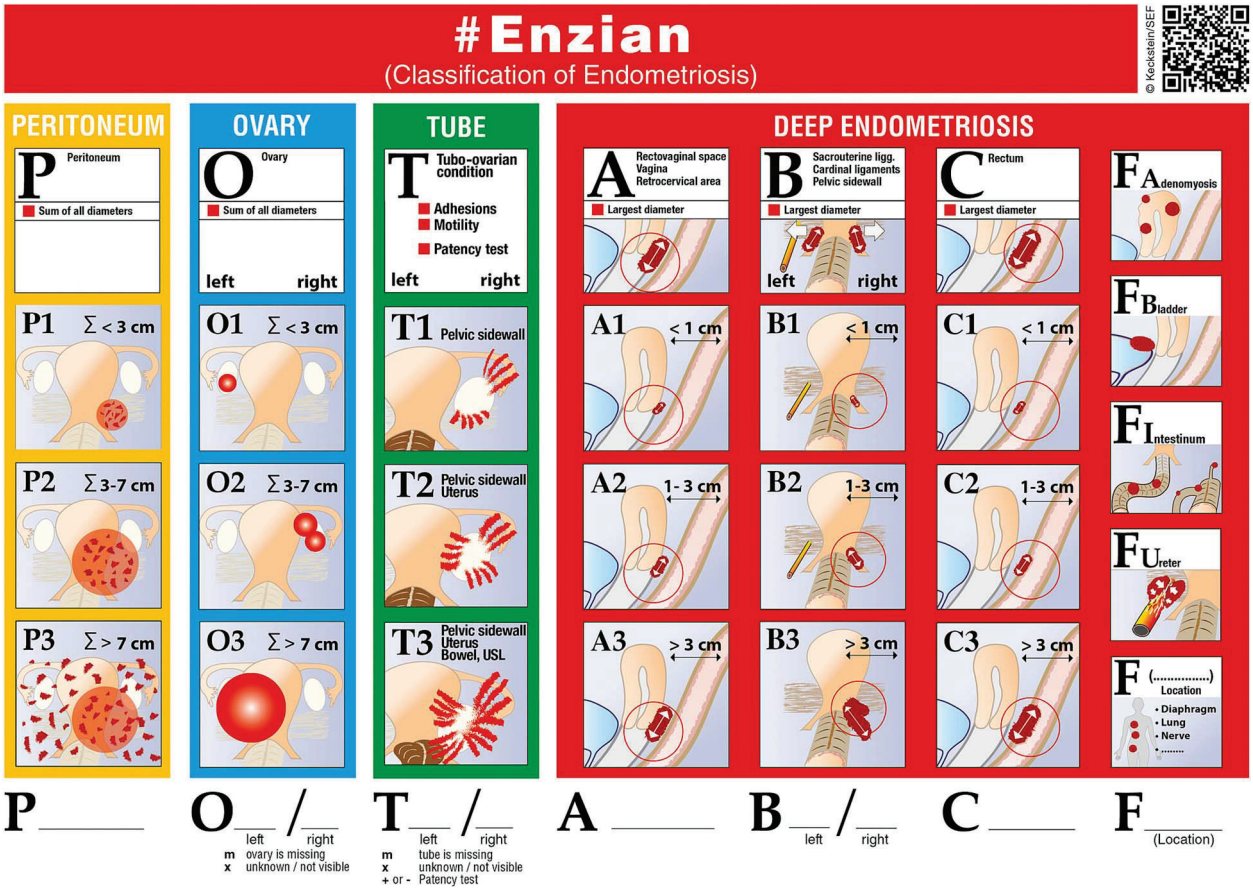


Figure 3. Enzian classification: overview with potentially affected organs and compartments.

surgery for DIE at a tertiary referral center for endometriosis. The disease was classified according to the rASRM and Enzian surgical classifications.

Materials and methods

A sociodemographic questionnaire was developed for this study. Participants reported on age, educational qualifications, profession, living situation, relational situation, number of children, if they feel that they suffer or have suffered from any psychological or psychiatric problem, if they have psychological or psychiatric support, if they believe in any religion.

The initial evaluation was performed during the consultation. Data collected at this stage included patient identification, reasons for referral to the endometriosis consultation, obstetric and gynecologic history, general medical history, symptoms, and results from complementary diagnostic tests. A physical examination, including a pelvic exam, was conducted to identify vaginal or rectovaginal nodules.

Operative reports from past surgeries and pathological anatomy results were reviewed to classify each patient's disease using the rASRM and Enzian surgical classification systems.

Endometriosis classification systems

The Enzian classification is described on Figures 3, 4, and 5[19], and the rASRM classification is described on Figure 2.[16]

The rASRM classification evaluates disease extent and reproductive organ function during surgery. The stage is derived from a cumulative score based on lesion size in the ovaries and peritoneum, fallopian tube blockage, and adhesion severity at these sites. Cul-de-sac obliteration alone scores 40 points and qualifies as severe disease (Figure 2). The stages are: Stage I (1–5 points, minimal), Stage II (6–15 points, mild), Stage III (16–40 points, moderate), and Stage IV (>40 points, severe).

The #Enzian classification (Figure 3) is based on the known Enzian classification for DE using three compartments (A—vagina, rectovaginal space (RVS); B—uterosacral ligaments (USL)/cardinal ligaments/pelvic sidewall and C—rectum) as well as so-called F (ie far locations) such as the urinary bladder (FB), the ureters (FU), and other extragenital lesions (FO). It additionally covers the involvement of the peritoneum (P) (Figure 4), ovary (O) (Figure 5), other intestinal locations (sigmoid colon, small bowel; FI), as well as adhesions, involving the tubo-ovarian unit (T) (Figure 6), and, optionally, tubal patency.

In this article, since we were evaluating DIE of the pelvis and surgical reports made an accurate description of that area, we used exclusively the three compartments division (A, B, and C).

Sexual function

The Female Sexual Function Index (FSFI) is a 19-item questionnaire that evaluates general sexual functioning across six specific dimensions: desire, arousal, lubrication, orgasm, sexual satisfaction, and sexual pain. Higher scores indicate better sexual functioning, while a total score ≤ 26.55 indicates the presence of sexual dysfunction. The FSFI is the most widely utilized self-report instrument for evaluating female

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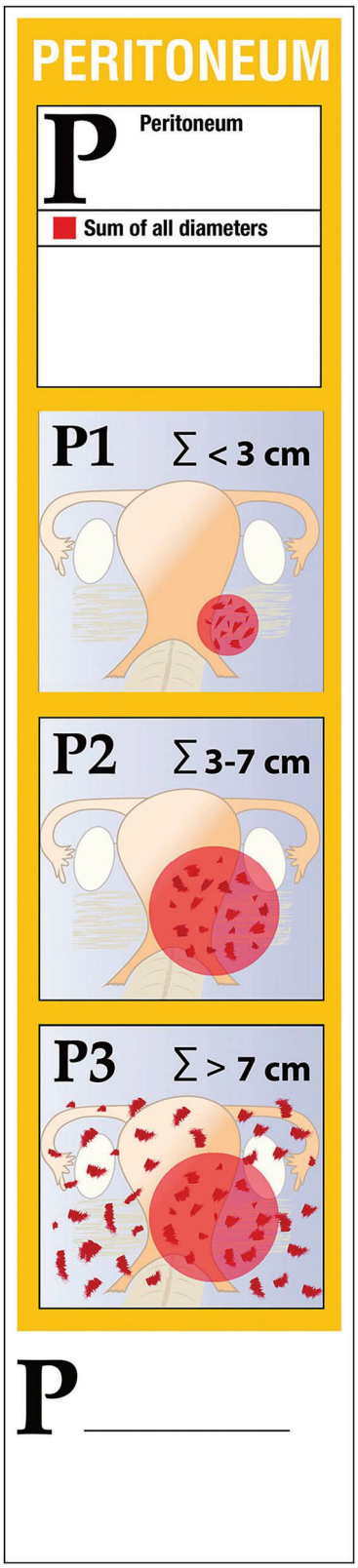


Figure 4. Enzian classification for peritoneal disease, P.

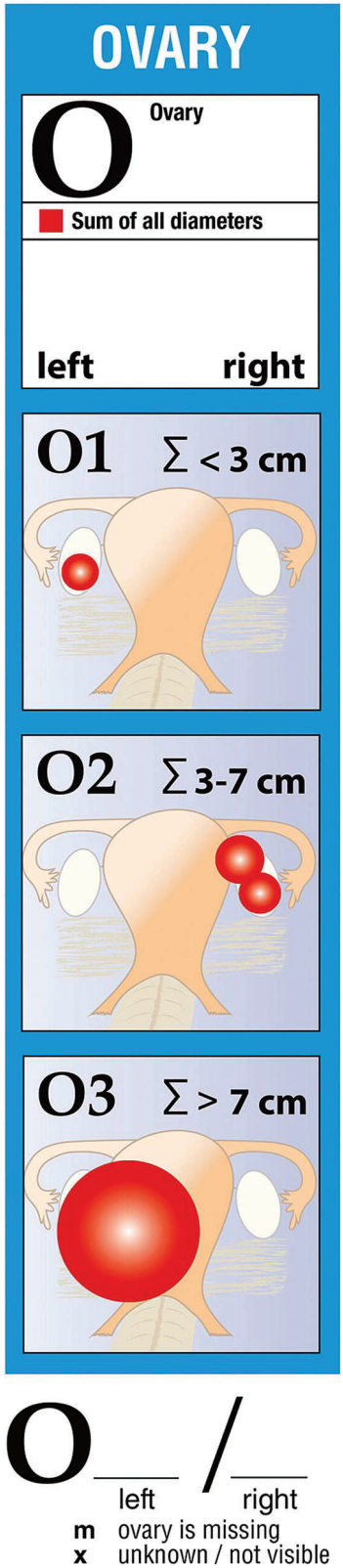


Figure 5. Enzian classification for ovarian endometriosis, O.

sexual difficulties, frequently employed in both clinical and research settings globally.[20,21] Its psychometric properties and factorial structure have been rigorously examined across multiple languages,[22-29] consistently demonstrating robust outcomes.

Statistical analysis

Statistical analyses were conducted using Fisher's exact test, the Mann–Whitney test, and Student's t-test. Data analysis was performed with SPSS version 20.0 statistical software (IBM®, Armonk, NY), with a significance level (p) set at 5%.

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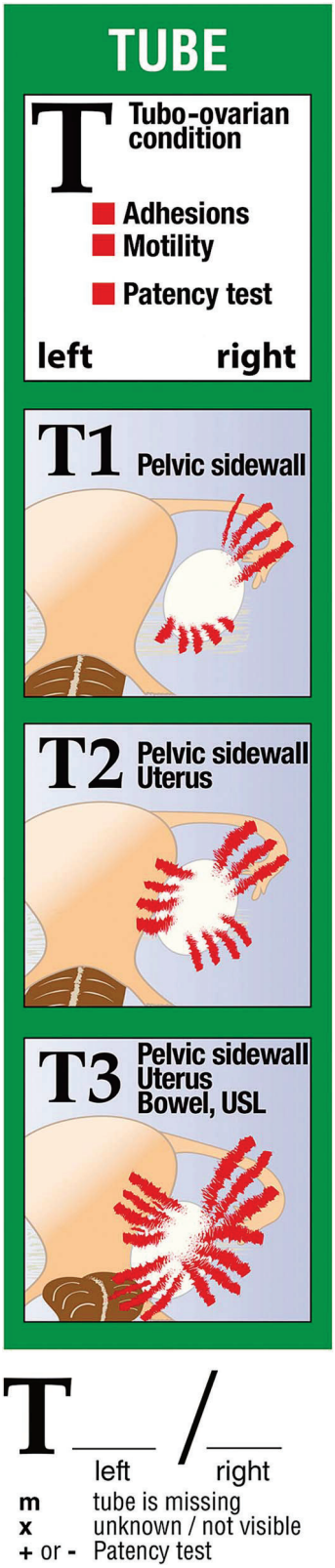


Figure 6. Enzian classification for the tubo-ovarian condition, T.

The sample size was determined based on the population of our specialized endometriosis consultation. Data collection was conducted over one year to ensure an adequate representation of patients attending the consultation within this period. Initially, the study population consisted of 300 patients; however, only 102 participants fully completed the questionnaires, which represents a limitation of this study. This reduced sample size may impact the statistical power and the generalizability of the findings. Despite this limitation, the study provides valuable insights into the relationship between DIE and sexual function.

The grouping of Enzian classifications, such as Enzian A + B, Enzian B + C, and Enzian A + C, for statistical purposes is justified by the need to evaluate the cumulative impact of multiple localizations of endometriotic lesions on sexual function. By combining these classifications, we can address the impact of multifocal disease on sexual function and enhanced statistical power.

Table 1. Demographic characteristics of the participants.

Demographic characteristics of the participants		
Age (years)	Mean ± SD or count (%)	37 ± 7 [23; 56]
Educational qualifications	. Primary education	0 (0%)
	. Secondary education	46 (59.7%)
	. Higher education	31 (40.3%)
Lives with	. Spouse or partner	35 (45.4%)
	. Spouse or partner and children or stepchildren	24 (31.2%)
	. Parents	12 (15.6%)
	. Other	6 (7.8%)
Relational situation	. Married or registered partnership	56 (72.7%)
	. Committed relationship	6 (7.8%)
	. Single, divorced, widow	15 (19.5%)
Number of children	. 0	3 (3.9%)
	. 1	42 (54.5%)
	. ≥ 2	32 (41.6%)
Do you feel that you suffer or have suffered from any psychological or psychiatric problem?	. yes	33 (42.9%)
	. no	44 (57.1%)
Did you have psychological or psychiatric support?	. No	52 (67.5%)
	. Had in the past	18 (23.4%)
	. Yes	7 (9.1%)

Results

Descriptive results

The socio-demographic data gathered through the online questionnaire are summarized in Table 1. Participants had a mean age of 37 years (±7), ranging from 23 to 56 years. The majority had completed secondary education (59.7%), followed by higher education (40.3%), with no participants reporting only primary education. Most respondents lived with a spouse or partner (45.4%) or with a spouse/partner and children (31.2%), while smaller proportions lived with parents (15.6%) or others (7.8%). Regarding marital status, 72.7% were married or in a registered partnership, 7.8% were in a committed relationship, and 19.5% were single, divorced, or widowed. Parenthood data showed that 54.5% had one child, 41.6% had two or more children, and 3.9% had no children. In terms of psychological health, 42.9% reported past or current psychological/psychiatric issues, and 9.1% were receiving support at the time of the survey. Additionally,

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Table 2. Data collected during gynecological consultation.

Data collected during gynecological consultation	
Reason for Consultation	Pain – 53 (68.8%) Pain + Infertility – 2 (2.6%) Pain + Abnormal uterine bleeding – 7 (9.1%) Infertility – 2 (2.6%) Abnormal uterine bleeding – 3 (3.9%) Endometriosis lesions on ultrasound – 4 (5.2%) Sent by general surgery or gastroenterology (endometriosis identified on the bowel) – 4 (5.2%) Endometriosis nodule on the umbilicus – 2 (2.6%)
Gynecological History	
Age at Menarche	12 ± 2 [8; 16]
Duration of menses	
≤ 7days	67 (87%)
≥ 8 days	10 (13%)
Contraception used	
Yes	30 (39%)
No	47 (61%)
Coitarche	18 ± 2 [14;25]
General Medical History	NA
Symptoms	NA
Physical exam	NA
Complementary Diagnostic Exams	NA

NA-not applicable

23.4% had received psychological support in the past, while 67.5% had never sought such assistance.

Table 2 summarizes the data collected during the gynecological consultations, including reasons for consultation, gynecological history, general medical history, reported symptoms, physical exam findings, and complementary diagnostic exams. The primary reason for consultation was pain (68.8%), with smaller proportions consulting for pain and infertility (2.6%) or pain and abnormal uterine bleeding (9.1%). Other reasons included infertility alone (2.6%), abnormal uterine bleeding (3.9%), endometriosis lesions detected on ultrasound (5.2%) or were referred by general surgery or gastroenterology due to endometriosis identified on the bowel (5.2%), 2.6% had an endometriosis nodule on the umbilicus. The mean age at menarche was 12 years (±2), ranging from 8 to 16 years. Most participants (87%) reported a duration of menses of ≤7 days, while 13% reported a duration of menses ≥8 days. Regarding contraceptive use, most participants (61%), were not using contraception, while 39% reported using contraceptives. The average age at first sexual intercourse was 18 years (±2), ranging from 14 to 25 years.

Sexual dysfunction and disease localization

Table 3 summarizes the relationship between sexual dysfunction, as assessed by the FSFI, and the localization of endometriosis, classified according to The #Enzian classification system (only compartments A, B, and C of this classification were used in this analysis). A FSFI score ≤ 26.55 indicates sexual dysfunction, and data from the last four weeks of sexual activity were considered for analysis.

- Enzian A Localization: Of the 77 patients, 42.5% (n = 31) had no Enzian A localization and no sexual dysfunction, 57.5% (n = 42) had Enzian A localization without sexual dysfunction, and 100% (n = 4) of those with Enzian A localization experienced sexual dysfunction. No patients without Enzian A localization reported sexual dysfunction.
- Enzian B Localization: Among 77 patients, 68.5% (n = 50) had no Enzian B localization and no sexual dysfunction, while 31.5% (n = 23) had Enzian B localization but no sexual dysfunction. Notably, 100% (n = 4) of patients with Enzian B localization experienced sexual dysfunction. There were no cases of sexual dysfunction in patients without Enzian B localization.
- Enzian C Localization: In this cohort, 74% (n = 54) had no Enzian C localization and no sexual dysfunction, while 26% (n = 19) had Enzian C localization with no sexual dysfunction. Of those without Enzian C localization, 75% (n = 3) reported sexual dysfunction, compared to 25% (n = 1) with Enzian C localization and sexual dysfunction.

Statistical analysis using Fisher's exact test identified Enzian B localization as associated with sexual dysfunction (0.013∗). This result suggests that patients with Enzian B localization are more likely to experience sexual dysfunction compared to those without this localization.

Further subgroup analyses, as presented in Table 4, explored combinations of deep endometriosis localization based on The #Enzian classification system. These combinations of localization (eg, Enzian A + B, Enzian B + C, Enzian A + C) were examined in relation to sexual dysfunction.

- Enzian A + B Localization: 30.1% (n = 22) had no Enzian A + B localization and no sexual dysfunction, 69.9% (n = 51) had Enzian A + B localization and no sexual dysfunction, 0% (n = 0) had no Enzian A + B localization and sexual dysfunction, 100% (n = 4) had Enzian A + B localization and sexual dysfunction.
- Enzian B + C Localization: 34.2% (n = 25) had no Enzian B + C localization and no sexual dysfunction, 65.8% (n = 48) had Enzian B + C localization and no sexual dysfunction, 0% (n = 0) had no Enzian B + C localization and sexual dysfunction, 100% (n = 4) had Enzian B + C localization and sexual dysfunction.
- Enzian A + C Localization: 50.7% (n = 37) had no Enzian A + C localization and no sexual dysfunction, 49.3% (n = 36) had Enzian A + C localization and no sexual dysfunction, 0% (n = 0) had no Enzian A + C localization and sexual dysfunction, 100% (n = 4) had Enzian A + C localization and sexual dysfunction.

The analysis revealed that none of these subgroup groupings showed statistically significant associations with sexual dysfunction. This suggests that while the localization of deep endometriosis in different compartments may vary, the combination of these localizations does not significantly impact the likelihood of experiencing sexual function.

Additionally, when considering only those participants who reported sexual activity within the last four weeks, the patterns observed in Tables 3 and 4 remained unchanged, further reinforcing the consistency of the findings.

Using Fisher's exact test, none of these groupings showed statistically significant differences, indicating no relationship between Enzian groupings and sexual dysfunction.

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Table 3. Relationship between sexual dysfunction (as measured by FSFI) and disease localization (as classified by Enzian).

Relationship between sexual dysfunction and disease localization				
		Sexual Dysfunction		
		No	Yes	p-value
Enzian A	No	31 (42.5%)	0 (0%)	0.144
	Yes	42 (57.5%)	4 (100%)	
Enzian B	No	50 (68.5%)	0 (0%)	**0.013***
	Yes	23 (31.5%)	4 (100%)	
Enzian C	No	54 (74%)	3 (75%)	1
	Yes	19 (26%)	1 (25%)	

Table 4. Analyses based on groupings of Enzian classifications (Enzian A + B, Enzian B + C, Enzian A + C) in relation to sexual dysfunction.

Relationship between sexual dysfunction and disease localization grouping				
		Sexual Dysfunction		
		No	Yes	p-value
Enzian A + B	No	22 (30.1%)	0 (0%)	0.320
	Yes	51 (69.9%)	4 (100%)	
Enzian B + C	No	25 (34.2%)	0 (0%)	0.298
	Yes	48 (65.8%)	4 (100%)	
Enzian A + C	No	37 (50.7%)	0 (0%)	0.116
	Yes	36 (49.3%)	4 (100%)	

Table 5. Association between sexual dysfunction and the number of localizations.

Association between sexual dysfunction and the number of localizations				
		Sexual Dysfunction		
		No	Yes	p-value
Number of Localizations	0	18 (24.7%)	0 (0%)	**0.015***
	1	30 (41.1%)	0 (0%)	
	2	21 (28.8%)	3 (75%)	
	3	4 (5.5%)	1 (25%)	

When examining sexual activity within the last four weeks (including all participants who completed the health questionnaire), Tables 3 and 4 remained unchanged. This consistency implies that all observations involved individuals who had engaged in sexual activity within the last four weeks.

Sexual dysfunction and number of endometriosis locations

Table 5 assesses the relationship between sexual dysfunction and the number of endometriosis locations (classified by Enzian A, B, and C). Participants were categorized based on the number of affected locations: 0, 1 (A, B, or C), 2 (A + B, A + C, or B + C), and 3 (A + B + C).

- No sexual dysfunction: 24.7% (n = 18) of patients with zero localization, 41.1% (n = 30) with one localization, 28.8% (n = 21) with two localizations, and 5.5% (n = 4) with three localizations had no sexual dysfunction.
- With sexual dysfunction: No patients with zero or one localization reported sexual dysfunction. Among those with two localizations, 75% (n = 3) had sexual dysfunction, and 25% (n = 1) with three localizations also experienced sexual dysfunction.

The Mann–Whitney test revealed a statistically significant relationship between the number of affected locations and the presence of sexual dysfunction ($P = 0.015*$), suggesting that a higher number of disease localizations is associated with an increased likelihood of sexual dysfunction.

Symptom analysis and disease localization

The study also evaluated the association between the most common endometriosis symptoms (dysmenorrhea, dyspareunia, dyschesia, dysuria, and chronic pelvic pain) and disease localization (Table 6). No statistically significant associations were found between the symptoms and the localization of endometriosis according to the ENZIAN classification (A, B, or C). This indicates that the presence of specific symptoms does not significantly correlate with the anatomical distribution of endometriosis lesions.

Disease extent (rASRM score) and sexual dysfunction

Table 7 examines the relationship between disease extent, as assessed by the rASRM score, and sexual dysfunction. The Mann–Whitney test returned a p-value of 0.572, suggesting no significant association between rASRM score and

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Table 6. Association between symptoms and localization of the disease.

Association between symptoms and localization of the disease									
	Enzian A			Enzian B			Enzian C		
	No	Yes	P-value	No	Yes	P-value	No	Yes	P-value
Dysmenorrhea	8 [5;10]	4[1;9]	**0.162**	6[1;9]	7.5[1;10.5]	**0.661**	5[1;9]	9.5[7;11]	**0.065**
Dyspareunia	3[1;6]	6[1;8]	**0.112**	3[1;8]	6[1;8]	**0.237**	3.5[1;7.8]	6[1;8]	**0.154**
Dyschezia	1[1;2]	1[1;4]	**0.403**	1[1;1]	1[1;6]	**0.494**	1[1;2]	1[1;5]	**0.532**
Dysuria	1[1;1]	1[1;1]	**0.562**	1[1;1]	1[1;1]	**0.257**	1[1;1]	1[1;1]	**0.141**
Chronic Pelvic Pain	1[1;7]	1[1;1]	**0.890**	1[1;4]	1[1;5]	**0.673**	1[1;3]	1[1;5]	**0.371**

Table 7. Association between sexual dysfunction (as measured by FSFI) and disease extent (as classified by rASRM Score).

Association between sexual dysfunction and disease extent (as classified by rASRM Score)				
		Sexual Dysfunction		
		No	yes	p-value
rASRM Score	Median [AIQ][Min; Max]	2 [1; 4][1; 4]	3 [3; 4][2; 4]	0.572

sexual dysfunction. This indicates that the overall extent of endometriosis, as measured by the rASRM score, does not have a significant impact on sexual function.

Discussion

To our knowledge, this is the first study to explore the ability of a classification system to pinpoint a sexual dysfunction in endometriosis to a particular anatomical location, providing novel insights into DIE's impact on sexual health.

Our findings suggest a possible relationship between sexual dysfunction and Enzian B localization of the disease. This indicates that the involvement of the uterosacral ligaments, cardinal ligaments, or pelvic sidewall may directly impact sexual function. However, it is important to note that only a small number of participants reported sexual dysfunction (6 in total), with FSFI responses available for only 4. These results align with the conclusions of Ferrero et al.,[11] who observed that DIE of the uterosacral ligaments had the most severe impact on sexual function. Enzian B classification encompasses disease involving the uterosacral ligaments, cardinal ligaments, and pelvic sidewall, further supporting this association. Similarly, Mabrouk et al.[15] reported that women with DIE experienced deep dyspareunia more frequently than those with isolated ovarian endometriosis. In contrast, Vercellini et al.[14] found no significant differences in sexual function based on different endometriosis localizations (retrovaginal or peritoneal/ovarian), suggesting that factors beyond anatomical location may contribute to sexual dysfunction.

No correlation was found between grouped Enzian classifications (eg, Enzian A + B, Enzian B + C, Enzian A + C) and sexual dysfunction, indicating that combining different locations does not affect sexual function. However, a significant association was identified between the number of affected locations of DIE and the presence of sexual dysfunction (p-value = 0.015*), suggesting that a higher number of locations of DIE may increase the likelihood of sexual dysfunction. This finding provides new insights, as previous studies have not specifically examined the cumulative impact of multiple affected locations on sexual function.

In contrast, no significant relationship was observed between the rASRM score and sexual dysfunction (p-value = 0.572). The rASRM score primarily assesses the extent of the disease rather than its location. This finding suggests that the location of the disease, particularly in the medial compartment of the pelvis, may have a greater impact on sexual function than the overall extent of the disease.

The Enzian classification may be more predictive of sexual dysfunction in endometriosis than the rASRM score because it specifically assesses DIE and its impact on key anatomical sites involved in dyspareunia. Lesions in the rectovaginal septum, uterosacral ligaments, bowel, and bladder—captured by Enzian but not fully accounted for in rASRM—may be linked to pain during intercourse due to inflammation, fibrosis, and restricted pelvic mobility. Moreover, DIE in the posterior compartment affects pelvic nerve pathways and muscular structures, exacerbating penetration and orgasm-related pain. Unlike rASRM, which primarily quantifies lesion size and adhesions, Enzian may reflect the functional consequences of deep lesion invasion into pain-sensitive structures, offering a more clinically relevant assessment of sexual dysfunction risk in affected individuals.

We did not find a statistically significant association between the most frequent symptoms of endometriosis (dysmenorrhea, dyspareunia, dyschesia, dysuria, and chronic pelvic pain) and the localization of the disease. This aligns with studies suggesting that symptom perception does not always correspond to anatomical findings, highlighting the complexity of pain processing and the potential role of central sensitization in endometriosis-related pain.

The clinical implications of these findings should be interpreted with caution. While Enzian B localization appears to be associated with sexual dysfunction, this does not establish a direct causal relationship. Other contributing factors, including additional undiagnosed lesions, central sensitization, psychological factors, and pelvic floor dysfunction, may also play a role. Furthermore, while surgical removal of DIE lesions may provide symptom relief for some patients, it remains uncertain whether excising Enzian B lesions would directly improve sexual function. Surgical interventions in these areas pose

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a risk of nerve damage, which could paradoxically worsen pain and negatively impact sexual function. Studies on postoperative outcomes indicate that nerve injury, particularly in regions with a high density of autonomic and sensory nerves, may contribute to persistent or worsening dyspareunia. This reinforces the importance of a cautious and individualized approach to surgical decision-making.

Another consideration is the possibility that the four patients with Enzian B lesions who reported sexual dysfunction had additional, undocumented endometriotic lesions that were not identified through available medical records or imaging. The presence of such lesions could introduce a confounding factor, influencing the observed associations. Differences in imaging techniques, surgeon expertise, and diagnostic criteria across multiple referral centers may have further contributed to variability in disease classification, potentially affecting the study's findings.

Rather than suggesting that all patients with Enzian B lesions would benefit from surgery, a multimodal treatment approach should be considered, incorporating surgery, sexual therapy, and pelvic floor physiotherapy. Shared decision-making is essential, ensuring that patients are informed about the potential risks, benefits, and alternative treatment options.

Strengths and limitations of the study

This study provides novel insights into the relationship between DIE localization and sexual dysfunction. A key strength is the use of the Enzian classification system, which allows for a more detailed anatomical assessment of DIE compared to the rASRM classification. Additionally, the study contributes to the limited body of literature exploring the impact of specific endometriosis locations on sexual function.

However, several limitations should be considered. The sample size of participants reporting sexual dysfunction was small, limiting the statistical power of the findings. Additionally, variability in medical records and imaging techniques across referral centers may have influenced the accuracy of disease classification. The retrospective nature of the study also introduces potential biases. Furthermore, while the study highlights associations between DIE localization and sexual dysfunction, it does not establish causality, as other factors such as central sensitization, psychological well-being, and pelvic floor dysfunction may also contribute.

Future research should aim to validate these findings with larger, multicenter, and longitudinal studies to further explore the interplay between disease localization, sexual dysfunction, and treatment outcomes. Additionally, studies assessing the impact of surgical interventions on sexual function should account for potential risks such as nerve injury and postoperative pain.

Conclusion

This study provides valuable insights into the relationship between the localization of DIE and sexual dysfunction, emphasizing the utility of the Enzian classification system in offering a more precise anatomical assessment compared to the rASRM classification. By exploring the impact of specific DIE locations on sexual function, this study contributes to a relatively underexplored area in endometriosis research. However, several limitations, including a small sample size, variability in medical records and imaging across referral centers, and the retrospective nature of the study, must be considered when interpreting the results. These factors may influence the accuracy of disease classification and introduce biases that limit the ability to draw definitive conclusions. While associations between DIE localization and sexual dysfunction were identified, causality cannot be established, and other contributing factors, such as central sensitization, psychological well-being, and pelvic floor dysfunction, must also be considered. Future research should focus on validating these findings through larger, multicenter, and longitudinal studies to better understand the complex relationship between DIE, sexual dysfunction, and treatment outcomes. Moreover, studies examining the impact of surgical interventions on sexual function should consider potential risks such as nerve injury and postoperative pain to optimize patient care and outcomes.

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To our patients, the real reason.

Author contributions

Paula Norinho: Conceptualization, Writing—original draft.
Rosa Zulmira Vaz de Macedo: Writing—review & editing.
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Conflicts of interest

None declared.

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