

When sex is not on fire: a prospective multicentre study evaluating the short-term effects of radical resection of endometriosis on quality of sex life and dyspareunia



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ABSTRACT

Objective: The aim of the current study was to evaluate the effect of surgical removal of endometriosis on dyspareunia, sexual function, quality of sex life and interpersonal relationships.

Study design: A questionnaire-based multicentre prospective study was conducted in six tertiary referral centres in Austria and Germany. Ninety-six patients with histologically proven endometriosis and dyspareunia were included. Before surgery and averagely 10 months postoperatively (range 9–12 months), the Female Sexual Function Index (FSFI) and the Female Sexual Distress Scale (FSDS) were used to screen women's sexuality. Additionally, we evaluated psychological parameters and pain intensity during/after sexual intercourse via a self-administered questionnaire.

Results: Pain scores measured via NAS during/after intercourse decreased significantly after surgery. Frequencies of interrupted sexual intercourse, feelings of guilt towards the partner, being afraid of pain before/during sexual intercourse and feelings of being a burden for the relationship also decreased significantly in patients with peritoneal endometriosis and deep infiltrating endometriosis. Interestingly, sexually related personal distress did not improve in women with peritoneal endometriosis/vaginal resection, but improved in cases of deep infiltrating endometriosis (DIE).

Conclusion: Radical laparoscopic excision of endometriosis offers an effective treatment option and offers a significant improvement in dyspareunia and quality of sex life.

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Introduction

Endometriosis as one of the most common gynaecological diseases in women's reproductive years is defined as endometriotic tissue outside the uterine cavity. Tissue responds to the ovarian steroids and reacts in the same way as the endometrium during the menstrual cycle. Endometriotic lesions extending more than 5 mm underneath the peritoneal surface are defined as deep

infiltrating endometriosis (DIE). Endometriosis has been shown to cause adhesions, local inflammatory reactions and pain symptoms such as dysmenorrhea, dyspareunia, chronic pelvic pain and/or a reduced level of fertility. In cases of bowel or bladder involvement, typical complaints are dyspareunia, dyschezia and dysuria [1]. This benign, but progressive and chronic disease affects approximately 2% of the general female population and about 50–70% of women with pelvic pain symptoms in their reproductive years [2]. Due to the proven diagnostic delay, patients experience disease-related symptoms between 3.3 years in China and 10.7 years in Austria and Germany before getting the correct diagnosis and treatment [3].

Literature shows the presence of endometriosis in 60–70% of women undergoing surgery for pelvic pain symptoms [4–6] and between 50% and 90% of those using hormonal therapies for

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chronic pelvic pain [7,8]. Dyspareunia, one of the most common symptoms, is classified into two types: superficial (pain in and around the vaginal introitus) and deep (pain with deep penetration) dyspareunia (SD, DD). In comparison with the general female population, women with endometriosis have a nine-fold increase in risk of dyspareunia [9]. DD is associated with deep infiltration of the cardinal and uterosacral ligaments, the pouch of Douglas (POD), the anterior rectal wall as well as the posterior vaginal fornix [10,11].

Dyspareunia not only causes pain, but also effects psychological and psychosocial wellbeing in symptomatic women. Within this, its presence is associated with a reduced number and/or interruption of sexual intercourses and a lower sexual function. Furthermore, feelings of fear before/during intercourse, emotions of guilt towards the partner and of being an insufficient woman are predominant. Not surprisingly, relationship and quality of sex life (QoSL) are affected distinctly by dyspareunia [12]. Consequently, endometriosis as a main causative factor for dyspareunia has been demonstrated to negatively effect psychosexual issues of couples with partners suffering from this disease [13]. The primary aim of endometriosis treatment is pain relief and improvement of quality of life. One possibility is hormonal treatment, but studies often show its limited efficacy regarding control of dyspareunia [6,14]. A further option is the radical resection of all visible endometriotic lesions, which requires a high level of technical competence in cases of extensive disease [15]. To date, there is a paucity of prospective studies evaluating the effect of radical resection of deep and peritoneal endometriosis and pain symptoms affecting sexual functioning.

The objective of the present analysis was to investigate the efficacy of surgical removal of endometriosis on dyspareunia, QoSL and predefined psychological parameters.

Patient and methods

Patient data

The present work was conducted in Austria and Germany in six participating certified tertiary referral centres for endometriosis. Between May 2011 and August 2012, consecutive symptomatic patients scheduled for surgical excision of endometriosis, were recruited prospectively. Patients with previous surgeries for endometriosis, pain symptoms of other origin (chronic disease other than endometriosis possibly causing pain symptoms) or a history of gynaecological malignancy/internal disease were excluded. Histological proof of disease was regarded mandatory.

Furthermore, only heterosexual women above 18 years of age and dyspareunia lasting for at least 6 months (and additional other pain symptoms related to endometriosis) and without any concomitant hormonal treatment (oral contraceptive pills, GnRH, etc.) within a period of 3 months onto the time of the surgical intervention until the point of postoperative symptom evaluation were invited to participate. Consecutive recruitment led to generation of data from 128 patients. Out of 128 women, one patient was homosexual and two patients did not provide informed consent and were excluded from the study in the first step (see Fig. 1). As stated, none of the included patients received hormonal treatment postoperatively. Patients gave written and

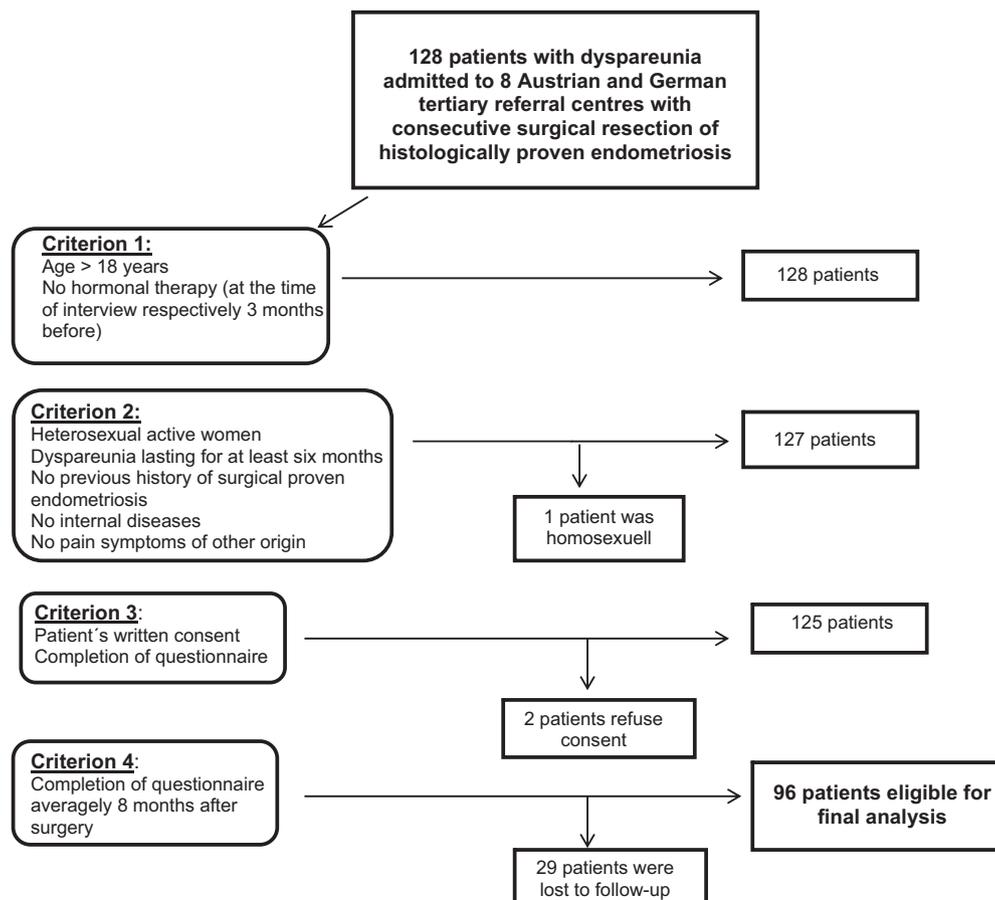


Fig. 1. Flow chart of study participants.

verbal information of the aim of the study and gave their signed informed consent before being enrolled.

Final inclusion in the study was performed after surgery and histological confirmation of endometriosis. Averagely 10 months after surgery (range 9–12 months), the index questionnaire, including questions about possible additional surgeries, pregnancy outcome and specific symptoms was evaluated via mail. Women who did not respond were telephoned and asked to complete the questionnaire. The study was approved by the local IRB.

Surgical treatment and preoperative examinations

Every woman underwent clinical examination (bimanual) and a transvaginal sonography (TVS). In cases of DIE with bowel and/or urinary bladder involvement additional imaging methods such as Magnetic Resonance Imaging (MRI) were used.

Patients were operated by 12 experienced surgeons in tertiary referral centres, and all surgical reports were re-evaluated by an experienced gynaecological surgeon (G.H.).

The severity of disease was scored according to the revised American Fertility Society scoring system (revAFS) [16]; all locations of endometriotic tissue were recorded. The aim of the surgical treatment was the complete resection of all visual endometriotic implants. In cases of infiltration of the vaginal wall, resection of the posterior fornix was performed with a laparoscopic or combined laparoscopic-vaginal approach. In cases of bladder or bowel involvement, partial bladder resection; disc or segmental rectal resection was performed depending on the extent of lesion size and infiltration depth. Every participating woman had histologically proven endometriosis. The detailed information on surgical procedures, peri- and long-term postoperative outcome and complication rates are reported in another work.

Evaluation of dyspareunia and sexual functioning/sexual distress

Female sexual dysfunction has been defined as alterations in sexual arousal, desire, orgasm and/or pain which cause personal distress. These characteristics were evaluated with the Female Sexual Function Index (FSFI). Furthermore, we aimed to evaluate whether patients with dyspareunia suffered from sexually related personal distress via the Sexual Distress Scale revised (FSDS).

Patients who agreed were informed about the study including follow-up investigation and were asked to complete a questionnaire consisting of three main parts:

FSDS

The first part consisted of the Female Sexual Distress Scale revised a screening instrument, consisting of 13 items for measuring sexually related personal distress. The fixed choice response format offered the five increments never, rarely, occasionally, often and always.

Sexual distress was defined as a FSDS-R-score >11, based on the published validation studies. The higher the score, the greater the distress [17].

FSFI

The Female Sexual Function Index which is made up of 19-items encompassing the six domains desire (items 1–2), arousal (items 3–6), lubrication (items 7–10), orgasm (items 11–13), satisfaction (items 14–16) and pain (items 17–19) representing the second part. The answering format was a Likert-scale with scores varying from 0 to 5.

The total FSFI-score is the sum of all points and the higher the score, the better the sexuality. Sexual dysfunction was defined as a FSFI-score <26.55, based on the published validations studies [18,19].

NAS and self-administered questions

Pain intensity during and after sexual intercourse was assessed with a numeric analogue scale (NAS) ranging from 1 to 10. Higher scores indicate greater severity of pain. Validity and reliability of NAS for pain measurement have been demonstrated [20]. Furthermore, self-administered questions about relationship, self-esteem and feelings of femininity were included. Altogether, 70 items evaluated clinical, personal, sexual and psychological parameters of patients.

Statistical analysis

Normality of data distribution was determined by mean and standard deviation. Analysis of interval data with a normal distribution were performed via dependent *t*-test for equality of means, ordinal data via Wilcoxon rank sum test and dichotomous categorical variables with the McNemar test. Analysis was undertaken using SPSS 16© software. A *p*-value of <0.05 was considered statistically significant and was the threshold to reject the null hypothesis.

Results

Altogether, 96/125 women completed pre- and postoperative questionnaires – representing a 76% response and follow-up rate. The mean patient age was 30.8 years (range 18–45). Patients suffered averagely 5.25 years (range 0.5–22) from dyspareunia and 57 out of 96 (59.4%) had DIE. All women were heterosexually active with a current median relationship of 7 years (range 0.5–22). Seventy-seven percent (74/96) were nulliparous, all others had one or more children (range 0–4). The majority of women (86/96; 89.6%) never had a miscarriage, the remaining number experienced one or more (range 0–2). As assessed by the revAFS, 27 women (28%) had a minimal (Stage I), 20 (21%) a mild (Stage II), 25 (26%) a moderate (Stage III) and 24 (25%) patients had a severe form (Stage IV) of endometriosis. For detailed information see Table 1.

Somatic changes after surgical excision of endometriosis

In cases of DIE (59%) and superficial endometriosis (41%), pain scores decreased significantly during (6.18 vs. 2.49; *p* < 0.001/5.05

Table 1
Demographic and clinical characteristics of 96 patients undergoing surgical excision of endometriosis.

	Mean	SD	Range
Age	30.8 yrs.	6.0 yrs.	18–45 yrs.
Duration of partnership	7.0 yrs.	6.3 yrs.	0.5–22 yrs.
Number of children	0.4	0.8	0–4
Number of abortions	0.1	0.4	0–9
Number of miscarriages	0.1	0.8	0–2
		<i>N</i>	%
Superficial/peritoneal endometriosis		39	41%
Deep infiltrating endometriosis (DIE)		57	59%
DIE with vaginal resection		21	37%
revAFS			
Stage I		27	28%
Stage II		20	21%
Stage III		25	26%
Stage IV		24	25%

vs. 2.85; $p < 0.001$) and after sexual intercourse (4.91 vs. 2.28; $p < 0.001/4.59$ vs. 2.56; $p < 0.001$) as well as events of interruption of intercourse (2.35 vs. 1.05; $p < 0.001/2.31$ vs. 1.64; $p < 0.001$). No increase was observable in the frequency of sexual intercourse per month (6.47 vs. 6.82; $p = 0.52/6.41$ vs. 7.13; $p = 0.32$). Interestingly, events of avoidance of sexual intercourse (2.51 vs. 3.0; $p < 0.001/2.69$ vs. 3.05; $p < 0.001$) increased following surgery.

In a subgroup analysis of women with vaginal resection ($n = 21$) NAS during/after sexual intercourse (6.64 vs. 2.18; $p < 0.001/5.09$ vs. 2.59; $p < 0.001$) and interruption (2.45 vs. 1.64; $p < 0.001$) improved significantly. Frequency per month did not change (6.34 vs. 7.03; $p = 0.85$); however, avoidance of sexual intercourse decreased significantly (2.27 vs. 2.98; $p < 0.001$).

Neither in cases of DIE/peritoneal endometriosis nor in these with vaginal resection, sexual function measured via FSFI changed ($p = 0.21/p = 0.11/p = 0.98$) after surgery. A significant postoperative change was observable in women with DIE and sexually related personal distress ($p = 0.04$); whereas patients with peritoneal endometriosis/vaginal resection, no improvement was given ($p = 0.34/p = 0.25$). See also Table 2.

Psychological changes after surgical excision of endometriosis

In women with DIE and peritoneal endometriosis, feelings of being a burden for the partnership because of dyspareunia (2.96 vs. 2.19; $p = 0.02/2.90$ vs. 2.03; $p < 0.001$), fear of separation (2.48 vs. 1.98; $p = 0.97/2.30$ vs. 1.72; $p = 0.04$), feelings of guilt towards the partner (2.84 vs. 2.30; $p < 0.001/2.54$ vs. 1.90; $p < 0.001$), physical tension (0.39 vs. 0.9; $p = 0.02/0.44$ vs. 0.23; $p = 0.04$), psychical tension (0.38 vs. 0.17; $p = 0.02/0.33$ vs. 0.31; $p = 0.88$) and afraid of pain before/during sexual intercourse (0.72 vs. 0.28; $p < 0.001/0.56$ vs. 0.33; $p = 0.02$) decreased significantly following surgery. In addition, satisfaction with the own sexuality (2.68 vs. 3.84; $p < 0.001/3.0$ vs. 3.49; $p = 0.04$), feeling of femininity (3.0 vs. 3.78; $p < 0.001/3.04$ vs. 3.98; $p = 0.04$) and QoSL improved significantly (3.25 vs. 3.91; $p < 0.001/3.41$ vs. 4.08; $p = 0.04$).

In the subgroup of women with vaginal resection for DIE, improvement of satisfaction with sexuality (2.36 vs. 3.25; $p < 0.001$) and with feeling of femininity (2.95 vs. 3.51; $p = 0.02$) improved significantly. Furthermore, in this subgroup feelings of guilt towards the partner (3.27 vs. 2.45; $p = 0.01$) and psychological tension before/during intercourse (0.36 vs. 0.09; $p = 0.03$) decreased. However, in none of the three groups (DIE/peritoneal endometriosis/vaginal resection), feelings of relaxation during intercourse improved significantly as demonstrated in Table 3.

Discussion

Dyspareunia not only causes severe pain, but also affects intimate relationships and self-esteem of patients. Although sexuality is an omnipresent issue in society, female dyspareunia and sexual dysfunction have not been investigated in detail in patients with endometriosis so far.

The strength of the present work is the sole inclusion of patients not taking additional hormonal preparations, at least 3 months before surgery and during follow-up period. These medications have an effect on dyspareunia and sexual function. Hence, these medications also might bias the result of surgery.

To the best of our knowledge, this is the first prospective study evaluation dyspareunia and quality of sex life with standardised valid psychometric tools. Despite the fact that radical laparoscopic excision of DIE is a controversial matter, our results show that dyspareunia during/after intercourse decreased significantly not only in patients with peritoneal, but also with deep endometriotic lesions and in those with an additional vaginal resection. The results also stand in line with previous studies, evaluating the surgical effect on dyspareunia in cases of endometriosis [21–26].

Surgical excision of endometriosis can be associated with several peri- and postoperative risks such as high blood loss, fistula or anastomotic insufficiency [21,26,27]. However, in a specialised multidisciplinary setting the complication rate is low and patient's advantages generally outweigh possible adverse effects [27].

The aim of the current study was not only to evaluate the somatic change in patients, but also the psychosomatic one. Especially in the case of dyspareunia, psychosomatic impacts may be severe. In the present work, satisfaction with own sexuality increased significantly in all three groups significantly as well as feelings of femininity. Due to negative experiences and fearful anticipations, physical/psychological tension and being afraid of pain during sexual intercourse are logical consequences. The results of the present study show that in cases of DIE physical/psychological tensions and being afraid of pain significantly improved following surgery; interestingly also women with peritoneal endometriosis have decreased physical tension and are significantly less afraid of coital pain.

Patients with DIE and an additional vaginal resection exhibited improvement regarding psychological tension before/during intercourse. However, none of these three groups experienced a significant increase in feelings of physical and psychological relaxation during sexual intercourse. It can be assumed that coital pain over years has a lasting effect on women's sexuality and a follow-up period of 10 months may be too short to demonstrate late onset effects. Within this, the persistent avoidance of intercourse following surgery might also be a consequence of a

Table 2

Change of somatic/clinical features 10 months after surgery in patients with DIE ($n = 57$), peritoneal endometriosis ($n = 39$) and vaginal resection ($n = 21$).

Clinical features	Deep infiltrating endometriosis	<i>p</i>	Vaginal resection	<i>p</i>	Peritoneal endometriosis	<i>p</i>
NAS ^a during intercourse	6.18 vs. 2.49	<0.001**	6.64 vs. 2.18	<0.001**	5.05 vs. 2.85	<0.001**
NAS ^a after intercourse	4.91 vs. 2.28	<0.001**	5.09 vs. 2.59	<0.01**	4.59 vs. 2.56	<0.001**
Frequencies of intercourse/month	6.47 vs. 6.82	0.52	6.34 vs. 7.03	0.85	6.41 vs. 7.13	0.32
Interruption of intercourse	2.35 vs. 1.05	<0.001**	2.45 vs. 1.64	<0.001**	2.31 vs. 1.64	<0.001**
Avoidance of intercourse	2.51 vs. 3.0	<0.001**	2.27 vs. 2.98	<0.001**	2.69 vs. 3.05	<0.001**
FSDS ^b		0.04*		0.25		0.34
FSFI ^c		0.21		0.98		0.11

^a Numeric analogue scale 1–10.

^b Female Sexual Distress Scale (FSDS).

^c Female Sexual Function Index (FSFI).

* $p < 0.05$.

** $p < 0.001$.

Table 3Change of psychosomatic features 10 months after surgery in patients with DIE ($n=57$), peritoneal endometriosis ($n=39$) and vaginal resection ($n=21$).

Psychosomatic features	Deep infiltrating endometriosis	<i>p</i>	Vaginal resection	<i>p</i>	Peritoneal endometriosis	<i>p</i>
Satisfaction with sexuality	2.68 vs. 3.84	<0.001**	2.36 vs. 3.25	<0.001**	3.0 vs. 3.49	0.04 [†]
Feelings of femininity	3.0 vs. 3.78	<0.001**	2.95 vs. 3.51	0.02 [†]	3.04 vs. 3.98	0.04 [†]
Feelings of guilt towards the partner	2.84 vs. 2.30	<0.001**	3.27 vs. 2.45	0.01 [†]	2.54 vs. 1.90	<0.001**
Feelings of being a burden for the partner	2.96 vs. 2.19	0.02 [†]	3.19 vs. 2.77	0.12	2.90 vs. 2.03	<0.001**
Fear of separation because of pain	2.48 vs. 1.98	0.97	2.67 vs. 1.95	0.05	2.30 vs. 1.72	0.04 [†]
Physical tension before/during intercourse	0.39 vs. 0.09	0.02 [†]	0.41 vs. 0.33	0.68	0.44 vs. 0.23	0.04 [†]
Afraid of pain before/during intercourse	0.72 vs. 0.28	<0.001**	0.66 vs. 0.50	0.07	0.56 vs. 0.33	0.02 [†]
Psychical tension before/during intercourse	0.38 vs. 0.17	0.02 [†]	0.36 vs. 0.09	0.03 [†]	0.33 vs. 0.31	0.88
Physical and psychical relaxation during intercourse	0.25 vs. 0.36	0.66	0.31 vs. 0.40	0.88	0.34 vs. 0.44	0.27
Quality of sex life	3.25 vs. 3.91	<0.001**	3.11 vs. 3.98	0.04 [†]	3.41 vs. 4.08	0.04 [†]

[†] $p < 0.05$.** $p < 0.001$.

rather limited follow-up interval regarding this parameter which might be a weakness of this study.

Conclusion

Taken together, the current study aimed to use validated multidimensional measuring instruments and the combined psychological and medical approach. The majority of studies published so far [21–23,27] focussed on endometriosis associated pain symptoms in general and did not focus on dyspareunia as an isolated severe symptom evaluated by instruments to evaluate sexual health and psychological wellbeing in detail as performed in the present work. Sexuality is a complex issue and is influenced by multiple factors. Nevertheless, the present study not only demonstrates a significant reduction of pain symptoms but also shows that resection of minimal and extensive endometriotic disease causes major positive changes regarding psychosexual wellbeing.

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Conflict of interest

No conflict of interest exists.

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