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Review

Dyspareunia and quality of sex life after surgical excision of endometriosis: a systematic review

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ABSTRACT

Dyspareunia, a common symptom of endometriosis, severely affects quality of sex life in affected women.

The objective of the present work was to review the effect of surgical resection of endometriosis on pain intensity and quality of sex life. MEDLINE and EMBASE databases were searched for papers investigating the outcome after surgical endometriosis resection on dyspareunia and quality of sex life measured via VAS/NAS respectively via standardised measuring instruments. Data did not permit a meaningful meta-analysis.

Out of 64 papers, three studies fulfilled the predefined inclusion criteria involving 128 patients with endometriosis and dyspareunia preoperatively.

All included studies showed a significant postoperative reduction ($p < 0.05$) of dyspareunia after a follow-up period of 12 up to 60 months. Sex life also improved significantly ($p < 0.05$), and predominantly evaluated parameters like quality of life and mental health. Intra- and postoperative complications were described in two out of three studies.

Surgical excision of deep infiltrating endometriosis is feasible and improves dyspareunia and quality of sex life significantly.

Contents

1. Introduction

Endometriosis as one of the most common gynaecological diseases in women's reproductive years and is defined as endometriotic tissue outside the uterine cavity. It affects approximately 2% of the general female population and about 50–70% of symptomatic women in their reproductive years [1]. Typical symptoms are dysmenorrhea, dyspareunia, non-cyclic

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chronic pelvic pain and/or a reduced level of fertility [2]. Interestingly, the correlation between extent of disease and severity of symptoms is poor [3]. This fact often complicates accurate diagnosis of endometriosis with an average diagnostic delay ranging between 3.3 years in China and up to 11.7 years in the USA [2,4–7]. Endometriotic implants which infiltrate the peritoneum more than 5 mm, are defined as deep infiltrating endometriosis (DIE) and present with nodular lesions, composed of fibromuscular tissue, endometrial glands and stroma. DIE is strongly associated with severe pelvic pain symptoms [8].

Dyspareunia, defined as pain during/after intercourse is a cardinal symptom of endometriosis and is classified into two types: superficial (pain in and around the vaginal introitus) and deep (pain with deep penetration) dyspareunia (SD, DD). It can be observed in 60–70% of women undergoing surgery [9–11] and between 50% and 90% of those using hormonal therapies for DIE [12,13].

Within this, dyspareunia is four times more frequent in women with endometriosis than in controls and five times more common in patients with peritoneal endometriosis than in such with endometriosis cysts [14]. Coital pain is most severe before menstruation [16] and associated with deep infiltrating endometriotic lesions of the uterosacral ligaments (USL) [15]. Another factor for the severe coital pain may also be the traction of scarred inelastic USL during sexual intercourse [16].

Dyspareunia in patients with endometriosis is often associated with a reduced number of intercourses, avoidance of intercourse [11,17], feelings of fear because of coital pain and feelings of guilt towards the partner [17]. It also correlates with a lower level of desire/arousal and a lower number of orgasms [11]. Furthermore, there is a significant correlation between dyspareunia and sexual dysfunction and/or sexual distress [17]. These facts show that dyspareunia not only affects physiological wellbeing but also quality of sex life and partnership [17].

In general, there are two options to treat this chronic disease: hormonal treatment or surgical excision of endometriotic nodules. Although hormonal treatment is efficient with respect to pain, the side effects of some type of drugs and the recurrence rate after cessation of the intake must be considered [18]. Surgical strategy is complete excision of all visually suspected and palpable endometriotic lesions to obtain total pain relief. However, also surgical intervention is associated with a risk of intra- and/or postoperative complications [19–21].

Therefore, the aim of the present work is to highlight the effect of surgical excision of endometriosis on dyspareunia and quality of sex life (QoSL).

2. Materials and methods

This systematic review of resection for endometriosis was initiated in order to evaluate the effect on pain intensity, possible complications and QoSL.

The MEDLINE and EMBASE databases were searched using the following search strategy:

1. articles in English
2. endometriosis
3. ‘endometriosis’, ‘dyspareunia’, ‘resection/excision’, ‘sex life’ in title or abstract
4. with checktags ‘female’ and ‘human’
5. no review articles, no case reports.

All studies in the current review had to be prospective and were required to involve both surgical excision of endometriosis and evaluation of QoSL. Another inclusion criterion was the use of at least one standardised measuring instrument evaluating QoSL.

Case reports, review articles and retrospective studies were excluded. Also studies, evaluating pre- and postoperatively pain intensity without Visual Analogue Scale (VAS) or Numeric Analogue Scale (NAS) with a scoring system from 1 (absence of pain) to 10 (worst imaginable pain) were excluded.

We started to review all identified articles describing the excision of endometriosis for several criteria, e.g. its impact on dyspareunia/QoSL, number of patients, follow-up and study design. A meta-analysis was not performed, as the data were too limited and varied widely between papers.

3. Results

The initial implementation of the research strategy revealed 64 papers related to resection of endometriosis and dyspareunia after surgery. Out of these 64 works, nine papers were review articles, three were not written in English. Further nine works were excluded because of a prospective study design, four were case reports and one paper was a repeated report from the same study. Twenty-six papers did not meet inclusion criteria due to the fact that they had not used standardised instruments evaluating QoSL and twelve works had a lack of information on target outcomes. Thus, only three papers fulfilled the predefined inclusion criteria and were included in the final review [19,21,22]. See also Fig. 1.

3.1. Surgical data

Median operating time varied from 107 min [21] to 228 min [19]. In three patients conversion to laparotomy occurred. In one case, the rectum had to be opened for complete excision and an anterior resection with colostomy was required [21], in the two other cases because of severe adhesions and problems in performing bowel anastomosis [19]. Ferrero et al. [22] did not report surgical data like operating time or conversion to laparotomy. None of the three papers described the hospitalisation time.

42% [21] and 11% [22] of patients and had stage revAFS I–II; 58% [21] and 89% [22] had stage revAFS III–IV.

3.2. Dyspareunia

The follow-up periods were 12 months [19,22] and 24 up to 60 months [21]. Only Ferrero et al. focussed on deep dyspareunia, the other two papers made no distinction between superficial and deep dyspareunia [19,21].

All studies evaluated dyspareunia via VAS and reported a significant improvement ($p < 0.05$; $p < 0.001$; $p < 0.001$) in dyspareunia after surgical excision of endometriotic lesions [19,21,22].

3.3. Complications

Complications were described in 2 papers [19,21]. Main complications were blood loss >500 ml (24/135; 17.8%) [21] and the requirement of blood transfusion (5/135; 3.7%) (Abbott), (1/22; 4.5%) [19]. Intentionally opening of the rectum because of extensive disease (4/135; 3%) [21], temporary urinary retention9 (3/22; 13.6%), postoperative vaginal bleeding (2/22; 9.1%), rectovaginal fistula (1/22; 4.5%) and uterine perforation with the uterine manipulator were also reported (1/35; 0.74%) (Table 1).

3.4. Confirmation of endometriosis by pathology

Only in one article histological confirmation of endometriosis was reported [21]. In the other two papers it was unclear whether confirmation was absent or not looked for [19,22].

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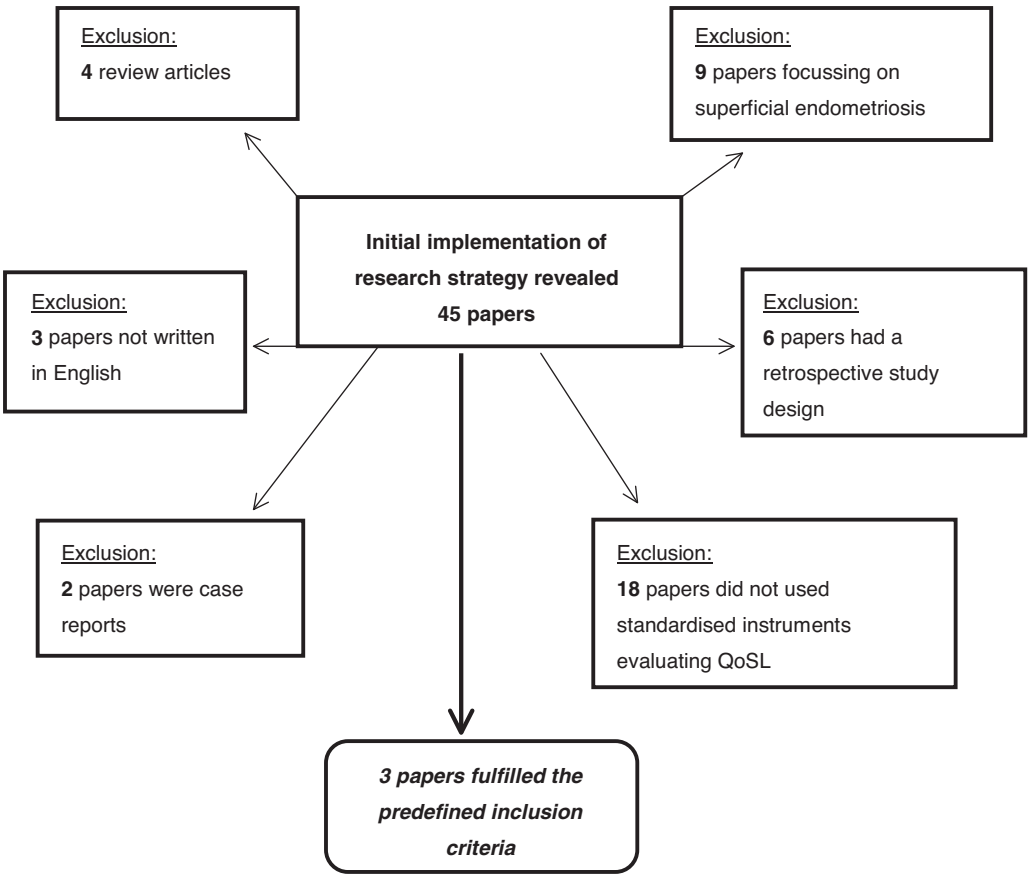

Fig. 1. Flow-chart of the research strategy.

3.5. Recurrence

Recurrence of endometriosis requiring surgical intervention was only reported by Abbott et al. (2007). Between index surgery and follow-up period of 2–5 years 16 (12%) patients underwent further surgeries.

3.6. Quality of sex life and psychological outcome

Surgical treatment of vaginal endometriosis has been a matter of controversy, but results show beside the pain relief also an impact on QoSL measured via McCoy Female Sexuality Questionnaire (MFSQ) [23]. This instrument evaluates sexual experiences during the past four weeks on 7-point Likert scale regarding different aspects of sexual life. It consists of the three subscales sexual satisfaction, sexual problems and satisfaction with the partner. Sexual satisfaction increased ($p < 0.05$) and sexual problems decreased significantly ($p < 0.05$) at a 12-months follow-up. Only satisfaction with the partner did not improve postoperatively [19].

In this study also health-related quality of life (QoL) was evaluated with a standardised, generic measuring instrument called 15D [24]. It provides 15 multiple-choice questions regarding to 15 health-related dimensions such as moving, mental function, discomfort & symptoms, sexual activity and distress. Every dimension has five grades of severity and the computed overall score yields values between 0 and 1; the lower the score, the lower is the health-related QoL [24]. Compared to baseline values, the dimensions distress, discomfort and symptoms, vitality and sexual activity improved significantly and also overall 15D-score significantly improved from 0.85 to 0.91 ($p < 0.05$) 12 months after complete excision of endometriosis including vaginal resection [19] (Tables 1 and 2).

Pre- and 12 months postoperatively, dyspareunia and QoSL were investigated via two standardised instruments by Ferrero et al. [22]. One of those was the Global Sexual Satisfaction Index (GSSI), reflecting the individual's global subjective perception of sexual behaviour. Patients had to rate their overall level of satisfaction on a 9-point scale defined at the lower extreme by "could not be worse" and at the upper extreme by "could not be better". The second measurement was the Sexual Satisfaction Subscale of the Derogatis Sexual Function Inventory (DSFI) [25]. This inventory is a multidimensional tool for the evaluation of various aspects of sexual and psychological function, composed of ten subscales which can be single chosen for specific research topics. The used subscale consists of nine items which can be answered on a 6-point Likert scale (1 = strongly disagree–6 = strongly agree) and reflects the level of sexual fulfilment [25].

At a 12-month follow-up, a significant improvement in dyspareunia ($p < 0.05$) and in patient's overall level of sexual satisfaction (GSSI, $p < 0.05$) were observed. Furthermore, they had increased frequency of intercourse and variety of sex life, were more relaxed during and more fulfilled after intercourse ($p < 0.05$). No significant improvement was observed regarding satisfaction with the partner, general interest in intercourse and communication about sex with the partner [22] (Tables 1 and 2).

Also a significant improvement ($p < 0.05$) in dyspareunia after laparoscopic excision of endometriotic lesions and in QoSL measured via Sexual Activity Questionnaire (SAQ) [26] with a 2–5 years follow-up reported Abbott et al. [21]. Sexual pleasure and discomfort decreased while sexual discomfort increased ($p < 0.05$). Furthermore, evaluation of patient's quality of life with the EQ-5Dindex/EQ-5Dvas improved ($p < 0.05$), but did not reach the level of normal population. Using the Health-Status Questionnaire (SF-12), a well validated generic measure, that can be used in

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Table 1
Improvement of dyspareunia after laparoscopic excision of deep infiltrating endometriosis.

Reference	Study design	Procedure	Individuals (*n*)	Follow up (months)	Complications		Dyspareunia (VAS)		Significance
					Intra-operative	Post-operative	Pre-operative	Post-operative	
Setälä et al. [19]	Prospective	Vaginal resection	22	12	No complications	3× temporary urinary retention 1× blood transfusion 2× vaginal bleeding[a] 1 rectovaginal fistula	4.3	1.7	Sig. (<0.05)*
Ferrero et al. (2006)	Prospective	Resection of the uterosacral ligaments	68	12	NA	NA	7.6	2.8	Sig. (<0.05)*
Abbott et al. [21]	Prospective	Resection	135	38	4× opening of the rectum because of extend disease 24× estimated blood loss >500 ml 2× blood transfusion 1× uterine perforation with the Valtchev uterine manipulator	3× blood transfusion	7.0	0	Sig. (<0.05)*

NA = specific data non available. Empty cells = no complications.
[a] Eight respectively 14 days after surgery.
* Significance set below 5%.

Table 2
Change in quality of sex life after laparoscopic excision of deep infiltrating endometriosis.

Reference	Study design	Procedure	Individuals (*n*)	Measuring instruments and outcomes				
				Follow up (months)	Measuring instrument	Result	Measuring instrument	Result
Setälä et al. [19]	Prospective	Vaginal resection	22	12	MFSQ[a]	Sexual satisfaction sig. (<0.05)* Sexual problems sig. (<0.05)* Sexual satisfaction with the partner n.s.	15D[b]	Discomfort and symptoms sig. (<0.05)* Distress sig. (<0.05)* Vitality sig. (<0.05)* Sexual activity sig. (<0.05)*
Ferrero et al. (2006)	Prospective	Resection of the uterosacral ligaments	68	12	GSSI[c]	Sig. (<0.05)*	DSFI[d] Subscale: sexual satisfaction	Sig. (<0.05)*
Abbott et al. [21]	Prospective	Resection	135	38	SAQ[e]	Sexual pleasure sig. (<0.05)* Sexual habit sig. (<0.05)* Sexual discomfort sig. (<0.05)*	SF-12[f]	Mental health n.s. Physical health n.s.

[a] McCoy Female Sexuality Questionnaire. 3 subscales: sexual satisfaction, sexual problems, sexual satisfaction with the partner. 7-Point Likert scale.
[b] 15D-Health-related Quality of Life Questionnaire. 15 dimensions: moving, seeing, hearing, breathing, sleeping, eating, speech, elimination, usual activities, mental function, discomfort and symptoms, depression, distress, vitality and sexual activity. Every dimension has five grades of severity.
[c] Global Sexual Satisfaction Index. 9-Point scale (0 = could not be worse–8 = could not be better).
[d] Derogatis Sexual Functioning Inventory. Only the subscale Sexual Satisfaction was used. 6-Point Likert scale.
[e] Sexual Activity Questionnaire. 3 subscales: pleasure, habit, discomfort.
[f] Health-Status Questionnaire. Short form. 4 physical health subscales: physical functioning, role-physical, bodily pain, and general health. 4 mental health subscales: vitality, social functioning, role-emotional, and mental health).
* Significant at the 0.05 level.

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different disease and treatment groups including four scales for physical and four scales for mental health, showed in the follow-up period an improvement in scores. The effect in the physical component was greater than in the mental component but without a statistical significance [21]. See also Tables 1 and 2.

4. Discussion

The objective was to analyse the outcome of surgical excision of all visible endometriotic lesions on dyspareunia and patient's QoSL.

QoSL as a very important parameter has rarely been investigated in this connection and therefore there is a lack of prospective studies evaluating the effect on pain relief and sexual wellbeing. Majority of research literature only evaluates postoperatively pain intensity in dyspareunia, and those few studies investigating also QoSL, often do not use standardised instruments, but self-administered questionnaires with not well known quality criteria (reliability, validity and objectivity).

Not surprisingly, we soon realised, that only very few papers meet our predefined inclusion criteria [19,21,22].

All three analysed prospective studies reported a significant improvement in dyspareunia postoperatively [19,21,22] and also over the last years complete surgical excision of endometriosis has become treatment of choice [27]. Therefore, this intervention seems to be with good reasons a widely accepted treatment option.

Complete surgical excision of endometriosis is, however, associated with a risk of intra- and postoperative complications. Because of this reason, surgery should be performed only in specialised pelvic pain clinics and after thorough consultation with the patient and consideration of possible complications.

Despite a follow-up period of at least 12 months, quality of sex life did not improve as fast as dyspareunia did. This fact shows that experiences of coital pain over years have a lasting effect on psychological wellbeing. A principal pathogenic mechanism in dyspareunia is altered awareness of pain recurrence due to previous experiences of coital pain. Therefore, the focus during sexual intercourse turns to sensation of (possible) pain instead of enjoyment. Experience of pain and the loss of pleasure are recurrently recognised and become reinforced by repeated experiences. This process creates a cognitive scheme of negative expectations that disturbs sexuality [28].

Sexuality is a complex and multidimensional phenomenon influenced by three key factors: physical, psychological and social wellbeing [29]. Because of this reason, a successful excision of endometriotic implants often is insufficient to improve a probably long lasting impaired sexuality overnight. Furthermore, feelings of being an insufficient partner because of pain, dysfunctional self-assessment and reduced self-esteem influence sexuality in the same way like coital pain [17].

Due to the fact that dyspareunia for women is often a shameful topic, gynaecologists involved in the management of endometriosis must offer patients a profound conversation about their sexuality, because these professionals in most cases are the first reference persons for suffering women [17].

Furthermore, a detailed analysis of patient's sexual history especially their sexual complaints, should be an essential component of every gynaecological anamnesis in patients with (suspected) endometriosis. Not only during the preoperative examination, but also in cases of follow-up-examinations sexuality should be focussed.

We also suggest in cases of dyspareunia in patients with endometriosis a multidisciplinary care in the hospital setting, consisting of gynaecologists, pain therapists and psychologists with a focus on sexual therapy. Only this approach enables a successful therapy at all levels and an optimal outcome for women possible.

Nevertheless, the present analysis has some limitations. First, investigated studies used different diagnostic criteria for endometriosis – only one study of the three papers included in the final analysis reported on histopathological confirmation of endometriosis [21]. Secondly, it remains unclear if patients exhibited DIE or purely superficial endometriosis in two of the three published studies [21,22], which might be a potential bias for QoSL outcome after surgery.

Furthermore, none of the papers reported on additional hormonal treatment following surgery which might influence the effect of surgery on postoperative wellbeing.

Nevertheless, we defined stringent inclusion criteria and as a consequence, the analysed data are limited to the small number of studies published so far.

However, to the best of our knowledge, this is the first systematic review focusing on the effect of surgical resection of endometriosis on dyspareunia and QoSL using standardised psychological instruments.

Indeed, more high quality studies are needed to gain more detailed knowledge on the issue of sexual function in women suffering from endometriosis.

In conclusion, the current paper provides evidence that surgical removal of endometriosis is a feasible and good treatment option for pain relief and also improves QoSL, but includes also a risk of intra-and postoperative complications.

Conflict of interest statement

No competing financial interests exist.

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