European Journal of Obstetrics & Gynecology and Reproductive Biology xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Love is a pain? Quality of sex life after surgical resection of endometriosis: a review

N. Fritzer [a,*], G. Hudelist [b,c]

[a] Department of Obstetrics and Gynaecology/Stage III Center for Endometriosis and Pelvic Pain, Wilhelminen Hospital Vienna, Austria
[b] Department of Gynaecology/Endometriosis and Pelvic Pain Clinic, Hospital St. John of God Vienna, Austria
[c] Stiftung Endometrioseforschung (SEF), Austria

ARTICLE INFO

Article history:
Received 31 December 2015
Received in revised form 5 April 2016
Accepted 23 April 2016

Keywords:
Endometriosis
Dyspareunia
Quality of sex life
Surgery

ABSTRACT

Dyspareunia, a common symptom of endometriosis and may severely affect quality of sex life in affected patients. 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 standardized measuring instruments. However, data did not permit a meaningful meta-analysis according to current standards. However, out of 69 papers, four studies fulfilled the predefined inclusion criteria involving 321 patients with endometriosis and dyspareunia preoperatively.

All included studies showed a significant postoperative reduction of dyspareunia after a follow-up period of 10 up to 60 months. Sex life as well as predominantly evaluated parameters like quality of life and mental health improved significantly. We therefore conclude that surgical excision of endometriosis is a feasible and good treatment option for pain relief and improvement of quality of sex life in symptomatic women with endometriosis.

Introduction

Endometriosis is one of the most frequent benign gynaecological disorders and affects approximately 2–15% of premenopausal women [1]. It is defined as the presence of endometrial stroma and glands outside the uterine cavity. Because of its inflammatory effects, endometriosis often causes pain symptoms such as dysmenorrhea, dyspareunia and in cases of bladder/bowel involvement may lead to dysuria and dyschezia [1]. Recent evidence indicates a diagnostic delay of approximately twelve years in central Europe [2]. In contrast to superficial endometriotic lesions, deep infiltrating endometriosis (DIE), which penetrates more than five millimetres under the peritoneal surface, confers invasion and destruction of organ layers [3].

Literature shows endometriotic disease as a main cause in 60–70% of women undergoing surgery for pain symptoms [4–8]. In comparison with the general female population, women with endometriosis have a nine-fold increase in risk for dyspareunia [9]. Deep dyspareunia has also been shown to be associated with deep endometriotic infiltration of the cardinal and uterosacral ligaments, the pouch of Douglas, the anterior rectal wall as well as the posterior vaginal fornix [10,11]. Within this, dyspareunia not only causes pain but also significant psychological and psychosocial impairment in affected women. It is strongly associated with a reduced number and/or interruption of sexual intercourses and a lower sexual function described by various measurement indices. Furthermore, feelings of fear before/during intercourse, emotions of guilt towards the partner and of insufficiency as a woman are predominant. Not surprisingly, partner relationships and quality of sex life (QoSL) are affected distinctly by dyspareunia [12].

In general, the treatment options include hormonal therapies in order to achieve a hypo-oestrogenic status, pain relieving agents or surgical removal of endometriotic implants. Hormonal preparations in some cases are a good choice, but can be associated with various side effects and a possible recurrence of symptoms after cessation of the intake. The aim of the surgical approach is the excision of all visible lesions to obtain a maximum effect regarding pain relief and increase in fertility. However, surgery may be associated with peri- and postoperative complications and also confers recurrence of disease even in optimally resected cases [13–15].

* Corresponding author at: Wilhelminen Hospital Vienna, Department of Obstetrics and Gynaecology, Montleartstraße 37, 1160 Vienna, Austria.
Tel.: +43 0650 3200938.
E-mail address: fritzern@gmx.net (N. Fritzer).

http://dx.doi.org/10.1016/j.ejogrb.2016.04.036
0301-2115/

This current work aimed to summarize the current evidence of the effect of surgical removal of endometriosis on dyspareunia and quality of sex life (QoSL). QoSL, as a multidimensional construct, should be evaluated with standardized psychological measuring instruments. As a consequence, we predominantly focused on literature using these tools for evaluation of surgical effects on sexual wellbeing. In addition, case reports, retrospective studies and review articles were excluded. All analyzed studies had to be prospective and were required to involve surgical resection of endometriosis and evaluation of QoSL. At least one standardized measuring instrument for QoSL and a visual analogue scale (VAS) or a numeric analogue scale (NAS) had to be used. A meta-analysis was not performed since data were too limited and varied widely between studies.

Results

We found 69 papers which related to the excision of endometriotic implants and effects on dyspareunia after surgery. Out of these 69 papers, nine were review articles and four were not written in English. Six were excluded because of a retrospective design, four were case reports and one paper was a repeated report from the same study. Twenty-nine manuscripts did not meet inclusion criteria due to the fact, that they did not use standardized tools evaluating QoSL and further twelve papers had a lack of information on target outcomes. Thus, only four papers fulfilled the predefined inclusion criteria and were included in the final analysis [13,15–17].

Surgical data

Altogether, postoperative outcome data of 321 patients were analyzed. Thirty-eight percent of patients had stage revAFS I-II and 82% stage revAFS III-IV disease [15–17]. One paper did not provide data on stage of the disease [13].

Median operating time varied from 107 min [15] to 228 min [13]. In three patients conversion to laparotomy occurred. In 3 cases, the rectum had to be opened for complete excision and anterior resection with colostomy was required [13,19]. Ferrero et al. [16] and Fritzer et al. [17] did not report surgical data like operating time or conversion to laparotomy. None of the four papers described hospitalization times. Only two articles reported on histological confirmation of endometriosis [15,17]. Complications were described in 2 papers [13,15]. Main intraoperative complications were blood loss >500 ml (24/135; 17.8%) and the requirement of blood transfusion (5/135; 3.7%) [15], (1/22; 4.5%) [13]. Intentional opening of the rectum because of extensive disease (4/135; 3%) [15], temporary urinary retention (3/22; 13.6%) [13], 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%) [13], Table 1.

Recurrence of endometriosis requiring surgical intervention was only reported by Abbott et al. [15]. Between index surgery and follow-up period of two-five years 16 (12%) patients underwent further surgical interventions.

In two studies patients received before surgery and during the follow-up period no concomitant hormonal treatment such as oral contraception pills, GnRH, etc. [16,17].

Dyspareunia

The follow-up periods ranged between 10 months [17], 12 months [13,15] and 24 up to 60 months [16]. Only two studies [16,17] focussed on deep dyspareunia, the other two papers made no distinction between superficial and deep dyspareunia [13,15]. In all studies dyspareunia was assessed with a visual/numeric analogue scale (VAS/NAS), a unidimensional measure of pain intensity. The ends of the scale are defined by "no pain" (score of 0) and "worst imaginable pain" (score of 10). Due to its simplicity and adaptability it is a feasible instrument used in different settings including chronic pain patients. Validity and reliability of NAS for pain measurement have been demonstrated [18]. A significant improvement ($p < 0.05$) in pain during intercourse after surgical excision of endometriotic lesions was observable in all analyzed studies [6,13,15,17], see Fig. 1.

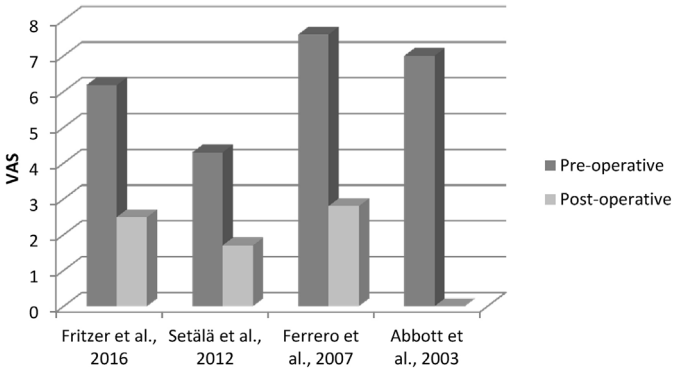

Fig. 1. Improvement of dyspareunia after laparoscopic excision of endometriosis.

Quality of sex life and psychological outcome

Quality of Life was evaluated with a standardized, generic measuring instrument, called 15D [19], which provides 15 multiple-choice questions regarding to 15 health-related dimensions. Compared to baseline values, the dimensions distress, discomfort, vitality and sexual activity significantly improved ($p < 0.05$) twelve months after complete excision of endometriosis including vaginal resection [13]. Furthermore, sexual satisfaction increased and sexual problems decreased significantly ($p < 0.05$). Only satisfaction with the partner did not improve postoperatively, measured via McCoy Female Sexuality Questionnaire (MFSQ) [13]. Recently, our group [17] showed a significant decrease of interruption and avoidance of sexual intercourse due to pain in a subgroup analysis of women with DIE and vaginal resection ($p < 0.05$) averagely ten months after surgery [17]. Within this, satisfaction with sexuality and feelings of femininity improved significantly ($p < 0.05$). Furthermore, feelings of guilt towards the partner and psychological tension before/during intercourse decreased ($p < 0.05$) [17], Tables 1 and 2.

Pre- and 12 months postoperatively, dyspareunia and QoSL were investigated via two standardized instruments by Ferrero et al. [16]. The Global Sexual Satisfaction Index (GSSI) reflects the individual's global subjective perception of sexual behaviour. Patients rate their overall level of satisfaction on a 9-point scale. In addition, the Sexual Satisfaction Subscale of the Derogatis Sexual Function Inventory (DSFI) was implemented [20] and is a multidimensional tool for the evaluation of various aspects of sexual and psychological function; the used subscale reflects the level of sexual fulfilment [20].

A significant improvement in dyspareunia ($p < 0.05$) and in patient's overall level of sexual satisfaction (GSSI, $p < 0.05$) was observed 12 months postoperatively. Furthermore, an increase of frequency of intercourse and variety of sex life was observed. Couples 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 [16]. A significant improvement in dyspareunia and QoSL measured via Sexual Activity Questionnaire (SAQ) was published over a two-five

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Table 1
Improvement of dyspareunia after laparoscopic excision of endometriosis.

Reference	Study design	Individuals (n)	Follow up (month)	Complications		Dyspareunia (VAS)		
				Intra-operative	Post-operative	Pre-operative	Post-operative	Significance
Fritzer et al. [17]	Prospective	96	10	NA	NA	6.18	2.49	Sig. (<0.05)*
Setälä et al. [13]	Prospective	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. [16]	Prospective	68	12	NA	NA	7.6	2.8	Sig. (<0.05)*
Abbott et al. [15]	Prospective	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.
* Significance set below 5%.
[a] Eight respectively 14 days after surgery.

year follow-up period by Abbott et al. [15]. 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 the normal population. Using the Health-Status Questionnaire (SF-12), a well-validated generic measure, 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 [15], Tables 1 and 2.

The fourth study included in the present review used the Female Sexual Function Index (FSFI) which is made up of 19 items encompassing six domains e.g. desire, arousal, lubrication, orgasm and the Female Sexual Distress Scale revised (FSD) a screening instrument, consisting of 13 items for measuring sexually related personal distress [17]. Averagely ten months (range 9–12) after surgery neither in cases of DIE/peritoneal endometriosis nor in these with DIE and vaginal resection, sexual function, measured via FSFI, changed. A significant postoperative change was observable in women with DIE and sexually related personal distress

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

Reference	Individuals (n)	Follow up (month)	Measuring instrument	Result	Measuring instrument	Result
Fritzer et al. [17]	96	10	FSFI[a]	DIE n.s. Superficial endometriosis n.s.	FSDS[b]	DIE Sig. (<0.05)* Superficial endometriosis n.s.
Setälä et al. [13]	22	12	MFSQ[c]	Sexual satisfaction Sig. (<0.05)* Sexual problems Sig. (<0.05)* Sexual satisfaction with the partner n.s.	15D[d]	Discomfort & symptoms Sig. (<0.05)* Distress Sig. (<0.05)* Vitality Sig. (<0.05)* Sexual activity Sig. (<0.05)*
Ferrero et al. [16]	68	12	GSSI[e]	Sig. (<0.05)*	DSFI[f] Subscale: sexual satisfaction	sig. (<0.05)*
Abbott et al. [15]	135	38	SAQ[g]	Sexual pleasure Sig. (<0.05)* Sexual habit Sig. (<0.05)* Sexual discomfort Sig. (<0.05)*	SF-12[h]	Mental health n.s. Physical health n.s.

[a] Female Sexual Function Index. 6 subscales: desire, arousal, lubrication, orgasm, satisfaction, pain. 6-point Likert scale.
[b] Female Sexual Distress Scale. 13 items. Fixed choice response format.
[c] McCoy Female Sexuality Questionnaire. 3 subscales: sexual satisfaction, sexual problems, sexual satisfaction with the partner. 7-point Likert scale.
[d] 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.
[e] Global Sexual Satisfaction Index. 9-point scale (0 = could not be worse – 8 = could not be better).
[f] Derogatis Sexual Functioning Inventory. Only the subscale *Sexual Satisfaction* was used. 6-point Likert scale.
[g] Sexual activity Questionnaire. 3 subscales: pleasure, habit, discomfort.
[h] Health-Status Questionnaire. 4 physical health subscales: physical functioning, role-physical, bodily pain, general health. 4 mental health subscales: vitality, social functioning, role-emotional, mental health).
* $p < 0.05$.

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($p < 0.05$); whereas in patients with peritoneal endometriosis/vaginal resection, no improvement was given ($p > 0.05$). In addition, satisfaction with the own sexuality, feelings of feminity and QoSL increased; physical/psychical tension and being afraid of pain before/during sexual intercourse decreased significantly following surgery. However, in none of the three groups (DIE/peritoneal endometriosis/DIE with vaginal resection), feelings of relaxation during intercourse improved [17].

Discussion

The majority of research literature predominantly evaluates postoperative pain intensity of dyspareunia, and few works use standardized instruments, but self-administered questionnaires with less known quality criteria (reliability, validity and objectivity). As a consequence, only few papers meet predefined inclusion criteria of quality reviews [13,15–17]. Despite the fact that radical laparoscopic excision of DIE is a controversial matter, the results of the present analysis show that dyspareunia during/after intercourse decreases significantly not only in patients with peritoneal but especially with deep endometriotic lesions which is in accordance with previous studies evaluating the surgical effect on dyspareunia in cases of endometriosis [22–25].

Surgical removal of endometriosis may be associated with several peri- and postoperative risks, but complication rates have been shown low and patient's advantages higher than possible adverse effects if treatment occurs in a specialized multidisciplinary setting and tertiary referral centres [23]. All prospective studies analyzed in this review reported a significant improvement in dyspareunia postoperatively [13,15–17]. Interestingly, despite a follow-up period of at least 10 months, quality of sex life did not improve as fast as symptoms of dyspareunia did. One possible reason may be the long lasting psychological effect of coital pain over years and a so-called hangover-effect on psychological wellbeing despite removal of the cause, i.e. endometriosis. Secondly, 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 may turn to sensation of (possible) pain instead of enjoyment. Experience of pain and the loss of pleasure are recurrently recognized and become reinforced by repeated experiences [26].

Due to the fact that dyspareunia often is a shameful topic, gynaecologists involved in the management of endometriosis should offer patients a profound conversation about their sexuality because these professionals in most cases are the first reference persons for suffering women [12]. Furthermore, a detailed analysis of patient's sexual history including 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 a target issue. Furthermore, multidisciplinary consisting of gynaecologists, pain therapists and psychologists with a focus on sexual therapy will lead to a successful therapy and an optimal outcome on a physiological and psychological level.

Nevertheless, the present analysis has some confounders. First and foremost, several groups used different diagnostic criteria for endometriosis – only two studies reported a histopathological confirmation of endometriosis [15,17], which remains the gold-standard-test. Secondly, the extent of surgical resection may have an impact on postoperative outcome and may therefore alter the result of the intervention in cases with residual disease or adenomyosis. In cases of hormonal therapy after surgery [13,15], it is not possible to define the specific role of surgery and hormonal treatment on the efficacy of treatment.

However, this paper provides evidence that surgical removal of endometriosis appears to be a feasible and good treatment option for pain relief and significant improvement of QoSL.

Funding

This work was supported by the OEGEO, Österreichische Gesellschaft für Endokrinologische Onkologie.

Conflict of interest

No conflict of interest exists.

References

[1] Ballard KD, Seaman HE, de Vries CS, Wright JT. Can symptomatology help in the diagnosis of endometriosis? Finding from a national case–control study – Part 1. BJOG 2008;115:1382–91.
[2] Hudelist G, Fritzer N, Thomas A, Niehues C, Oppelt P, Haas D, Tammaa A, Salzer H. Diagnostic delay for endometriosis in Austria and Germany: causes and possible consequences. Hum Reprod 2012;27:3412–6.
[3] Juhasz-Böss I, Laschke M, Müller F, et al. Endometriosis: survey of current diagnostic and therapeutic options and latest research work. Geburtshilfe Frauenheilkd 2014;78:733–42.
[4] Fauconnier A, Chapron Ch, Dubuisson JB, Vieira M, Dousset B, Bréart G. Relation between symptoms and the anatomic location of deep infiltrating endometriosis. Fertil Steril 2002;78:719–26.
[5] Chopin N, Vieira M, Borghese B, et al. Operative management of deeply infiltrating endometriosis: results on pelvic pain symptoms according to a surgical classification. J Minim Invasive Gynecol 2005;12:106–12.
[6] Ferrero S, Esposito F, Abbamonte LH, Anserini P, Remorgida V, Ragni N. Quality of sex life in women with endometriosis and deep dyspareunia. Fertil Steril 2005;83:573–9.
[7] Fedele L, Bianchi S, Zanconato G, Portuese A, Raffaelli R. Use of a levonorgestrel-relasing intrauterine device and the treatment of rectovaginal endometriosis. Fertil Steril 2001;75:485–8.
[8] Vercellini P, De Giorgo O, Mosconi P, Stellato G, Vicentini S, Crosignani PG. Cyproterone acetate versus a continuous monophasic oral contraceptive in the treatment of recurrent pelvic pain after conservative surgery for symptomatic. Fertil Steril 2002;77:53–61.
[9] Ballard KD, Seaman HE, de Vries CS, Wright JT. Can symptomatology help in the diagnosis of endometriosis? Findings from a national case–control study – Part 1. BJOG 2008;115:1382–91.
[10] Vercellini P, Fedele L, Aimi G, Pietropaolo G, Consonni D, Crosignani PG. Association between endometriosis stage, lesion type, patient characteristics and severity of pelvic pain symptoms: a multivariate analysis on 1000 patients. Hum Reprod 2007;22:266–71.
[11] Fauconnier A, Chapron C. Endometriosis and pelvic pain: epidemiological evidence of the relationship and implications. Hum Reprod Update 2005;11:595–606.
[12] Fritzer N, Haas D, Oppelt P, Renner S, Hornung D, Wölfler M, Ulrich U, Fischerlehner G, Sillem M, Hudelist G. More than just bad sex: sexual dysfunction and distress in patients with endometriosis. Eur J Obstet Gynecol Reprod Biol 2013;169:392–6.
[13] Setälä M, Harkki P, Matomaki J, Makinen J, Kossi J. Sexual functioning, quality of life and pelvic pain 12 months after endometriosis surgery including vaginal resection. Acta Obstet Gynecol Scand 2012;91:692–8.
[14] Kossi J, Setala M, Makinen J, Harkki P, Luostarinen M. Quality of life and sexual function 1 year after laparoscopic rectosigmoid resection for endometriosis. Colorectal Dis 2013;15:102–8.
[15] Abbott JA, Hawe J, Clayton RD, Garry R. The effects and effectiveness of laparoscopic excision of endometriosis: a prospective study with 2–5 year follow-up. Hum Reprod 2003;18:1922–7.
[16] Ferrero S, Abbamonte LH, Giordano M, Ragni N, Remorgida V. Deep dyspareunia and sex life after laparoscopic excision of endometriosis. Hum Reprod 2007;22:1142–8.
[17] Fritzer N, Tammaa A, Haas D, et al. 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. Eur J Obstet Gynecol Reprod Biol 2016;197:36–40.
[18] Jensen MP, Paul Karoly. Self-report scales and procedures for assessing pain in adults. In: Turk DC, Melzack R, editors. Handbook of pain assessment. 2nd ed., New York: The Guilford Press; 2001. p. 148–60.
[19] Sintonen H. The 15D instrument of health-related quality of life: properties and applications. Ann Med 2001;33:328–36.
[20] Derogatis LR, Melisaratos N. The DSFI: a multidimensional measure of sexual functioning. J Sex Marital Ther 1979;5:244–81.
[22] Fleisch MC, Xafis D, De Bruyne F, Huche J, Bener HG, Dall P. Radical resection of invasive endometriosis with bowel or bladder involvement – long-term results. Eur J Obstet Gynecol Reprod Biol 2005;123:224–9.
[23] Bassi MA, Podgaec S, Dias JAJ, D'Amico Filho N, Petta CA, Abrao MS. Quality of life after segmental resection of the rectosigmoid by laparoscopy in patients

Please cite this article in press as: Fritzer N, Hudelist G. Love is a pain? Quality of sex life after surgical resection of endometriosis: a review. Eur J Obstet Gynecol (2016), http://dx.doi.org/10.1016/j.ejogrb.2016.04.036

with deep infiltrating endometriosis with bowel involvement. J Minim Invasive Gynecol 2011;18:730–3.
[24] Mabrouk M, Montanari G, Guerrini M, et al. Does laparoscopic management of deep infiltrating endometriosis improve quality of life? A prospective study. Health Qual Life Outcomes 2011;9:1–7.
[25] Fritzer N, Keckstein J, Thomas A, Hudelist G. Radical resection of bowel endometriosis: long term implications on psychological wellbeing. J Gynecol Surg 2012;28:183–7.
[26] Elmerstig E, Wijma B, Bertero C. Why do young women continue to have sexual intercourse despite pain? J Adolesc Health 2008;43:357–63.

Please cite this article in press as: Fritzer N, Hudelist G. Love is a pain? Quality of sex life after surgical resection of endometriosis: a review. Eur J Obstet Gynecol (2016), http://dx.doi.org/10.1016/j.ejogrb.2016.04.036